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NUCLEAR WEAPONS MODERNIZATION PROGRAMS: MILITARY, TECHNICAL, AND POLITICAL REQUIREMENTS FOR THE B61 LIFE EXTENSION PROGRAM AND FUTURE STOCKPILE STRATEGY

HEARING

BEFORE THE

SUBCOMMITTEE ON STRATEGIC FORCES

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRTEENTH CONGRESS

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NUCLEAR WEAPONS MODERNIZATION PROGRAMS: MILITARY, TECHNICAL, AND POLITICAL REQUIREMENTS FOR THE B61 LIFE EXTENSION PROGRAM AND FUTURE STOCKPILE STRATEGY

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON STRATEGIC FORCES,
Washington, DC, Tuesday, October 29, 2013.

The subcommittee met, pursuant to call, at 3:30 p.m., in room 2118, Rayburn House Office Building, Hon. Mike Rogers (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. MIKE ROGERS, A REPRESENTATIVE FROM ALABAMA, CHAIRMAN, SUBCOMMITTEE ON STRATEGIC FORCES

Mr. ROGERS. Good afternoon. I want to welcome everybody to this hearing of the Strategic Forces Subcommittee and our hearing on nuclear weapons modernization programs. This subcommittee has been tracking this program—or these programs very closely, and this hearing is about digging into one in particular, the B61 Life Extension Program, or LEP.

Our distinguished witnesses all play important roles in the B61 LEP from a variety of angles. The witnesses comprise the key leaders responsible for the policy, military and operational requirements, program and oversight, and technical and program execution on the LEP. They will help us understand the details of the program, the requirements that are driving it, its history and current status, and its outlook for the future.

Our witnesses include the Honorable Madelyn Creedon, Assistant Secretary of Defense for Global Strategic Affairs, U.S. Department of Defense; General Robert Kehler, Commander, U.S. Strategic Command, also known as short-timer. He has got about another month before he retires on us. And we are going to be sad to see you leave, by the way.

General KEHLER. Thank you.

Mr. ROGERS. Dr. Donald Cook, Deputy Administrator for Defense Programs, National Nuclear Security Administration; Dr. Paul Hommert, President and Laboratories Director, Sandia National Laboratories.

I appreciate your taking the time to prepare for this hearing. I know it takes a lot of time and effort, and we do appreciate it, because it is very helpful to us. We always appreciate your contributions that each of you make for your country.

I am going to keep my statement very brief so that we can have the maximum time possible for questions and answers, but I do

want to take a moment to highlight one issue: the misconceptions and misinformation that we see in the public discourse on the B61 LEP. We have seen massively uninformed editorials and articles out there on the B61; arguments that NATO [North Atlantic Treaty Organization] should pay for the LEP, despite this being a U.S. nuclear weapon that we need for our own strategic deterrent; arguments that the B61 doesn't need to be rebuilt now, despite clear testimony to the contrary from our lab directors and military commanders, including General Kehler and Dr. Hommert; arguments that there is a reduced scope option for the LEP that would cost less and still meet requirements, despite numerous statements and documents from the administration showing the exact opposite is true.

The list goes on and on, and I plan to get into this during the questioning period. We will engage in a bit of myth-busting today and lay out the clear, undeniable facts about this critical program.

For now I would like to introduce for the record a series of documents provided to the committee by the DOD [Department of Defense] and DOE [Department of Energy] that clearly shows reality. And without objections, those will be submitted.

[The information referred to can be found in the Appendix beginning on page 73.]

Mr. ROGERS. It is time to leave aside the misinformation and fantasy that has seeped into the public debate, and deal with the real world.

Along the same lines, I offer the reality of military perspective. I would like to introduce for the record this letter we received from four commanders—from four former commanders of U.S. Strategic Command and its predecessor command. And without objection, those will be submitted.

[The information referred to can be found in the Appendix on page 84.]

Mr. ROGERS. These four retired senior officers eloquently summarized why cuts to the B61 LEP, as recommended by only one of the four congressional committees, would not only harm the U.S. deterrent, but also have major negative impacts on our allies and our nonproliferation goals.

Thank you again to our witnesses. I look forward to this discussion. And with that, let me turn to our ranking member today, Mr. Garamendi of California, for any statement that he may have.

[The prepared statement of Mr. Rogers can be found in the Appendix on page 31.]

STATEMENT OF HON. JOHN GARAMENDI, A REPRESENTATIVE FROM CALIFORNIA, SUBCOMMITTEE ON STRATEGIC FORCES

Mr. GARAMENDI. Thank you, Chairman Rogers, and thank the witnesses for participating in what is going to be a very important hearing.

Mr. Cooper could not be here today, and he asked that I sit in in his chair. I will do so as best I can, and I will read his statement quickly, or I will stop halfway through and put it in the record.

"President Obama in the Nuclear Posture Review laid out a strategy for maintaining a safe, secure, and reliable arsenal, while pursuing further nuclear weapons reductions and strengthening

nonproliferation. In this context we must understand what investments are necessary to carry out an effective strategy and maintain a credible nuclear deterrent to meet post-cold war threats in an era of constrained budgets.

"First with respect to the B61, there are concerns about the cost and complexity of the current planned B61 life extension and whether they are necessary for extended deterrence in the long-term. The administration is embarking on a $10 to $12 billion program, the most expensive life extension ever undertaken. This cost includes the warhead life extension program done by the National Nuclear Security Administration [NNSA], estimated to cost $8.1 billion to $10.1 [billion], and the Department of Defense's cost estimate of the program evaluation office, CAPE, added $1.6 billion required a new tail kit for the Air Force, bringing the total cost over $10 billion.

"We must better understand why a less expensive alternative, notably the 1E LEP option, is not being pursued. How long do we plan to keep the B61s deployed anyway? What constitutes credible political reassurance for our allies, and what reductions in the number of nuclear weapons are planned, and what safety risks are associated with forward-deployed B61? Former Secretary Sam Nunn recently wrote that today tactical nuclear weapons in the Euro-Atlantic region are more of a security risk than an asset to NATO. Is he correct?

"Second, more generally, we cannot consider the B61 in a vacuum. We must prioritize. And how do we plan for affordable, yet strong and effective nuclear deterrence?"

I think what I will do is to stop there and put the rest of it in the record. Thank you.

[The prepared statement of Mr. Cooper can be found in the Appendix on page 33.]

Mr. ROGERS. I thank the gentleman.

And now we will go to our witness statements, and we will remind you we would like you to summarize your statement for 5 minutes. And we will start with the Honorable Secretary Madelyn Creedon. You are recognized for 5 minutes.

STATEMENT OF HON. MADELYN R. CREEDON, ASSISTANT SECRETARY OF DEFENSE FOR GLOBAL STRATEGIC AFFAIRS, U.S. DEPARTMENT OF DEFENSE

Secretary CREEDON. Thank you very much, Chairman Rogers, Ranking Member Garamendi sitting in for Mr. Cooper, distinguished members——

Mr. GARAMENDI. I thank you.

Secretary CREEDON [continuing]. Distinguished members of the Strategic Forces Subcommittee. Thank you for the opportunity to testify today about the importance of the B61–12 Life Extension Program and the integrative part it plays in the administration's long-term modernization strategy for both the nuclear forces and the supporting nuclear infrastructure. I am pleased to join Deputy NNSA Administrator Dr. Cook, Sandia National Lab Director Dr. Hommert, and General Kehler for this discussion.

In the June 2013 nuclear employment guidance, the President reiterated and clarified two key policy elements that rely upon the

successful completion of the B61–12 Life Extension Program and execution of the long-term modernization strategy. The first is the commitment that the United States will retain a credible nuclear deterrent, supported by the nuclear triad, including the capability to forward-deploy nuclear weapons with heavy bombers and dual-capable fighter aircraft anywhere in the world. The second is the approach to hedge, so that we maintain the ability to hedge against technical and geopolitical risk that will lead to more efficient management of the nuclear weapons stockpile. This approach will allow, in time, reductions in the total number of weapons, while still maintaining the nondeployed weapons needed to ensure the U.S. stockpile is well positioned to provide the needed flexibility to respond to any contingency.

The joint NNSA and DOD long-term plan to manage and sustain the nuclear stockpile and associated infrastructure programs is presented in NNSA's Fiscal Year 2014 Stockpile Stewardship Management Plan. This plan provides the framework around which the new guidance will be implemented. At its heart is the baseline modernization strategy, also known as the "3+2" strategy. This strategy, if successful, will allow the consolidation of the 12 unique warhead types used today into 3 interoperable warhead designs for use on a submarine and land—for use on submarines and land-based missiles and 2 aircraft-delivered weapons, the B61–12 gravity bomb and the follow-on standoff cruise missile replacement.

This modernization strategy will permit hedging between the land and sea-based legs of the triad, reduce the size of the stockpile, and still maintain a sufficient hedge capability.

The tremendous benefit of the 3+2 strategy is that over time, it would reduce our stockpile life—stockpile life cycle sustainment costs and reduce the strain on our surveillance resources, while simultaneously increasing the safety, security, and effectiveness of our nuclear deterrent with fewer weapons.

The B61–12 is the first component of the 3+2 modernization strategy. A successful B61–12 Life Extension Program facilitates consolidation of four B61 types into one variant, and it also allows the eventual retirement of two other strategic air-delivered gravity bombs, the B61–11 and the B83.

To be sure, modernization work of this kind is expensive, but there is no doubt that the investment, which directly enables our commitment to effective nuclear deterrence and nonproliferation, is necessary. As you know, very early cost estimates of the B61–12 have grown as we sought to exercise national nuclear weapon engineering and design skills that had atrophied.

Having now finished the costing and developed a good baseline, we expect that any future cost growth is less likely to stem from technical or production costs than from difficult choices made by the Department of Defense and Energy to deal with ongoing budgetary uncertainty. Sequestration cuts, for example, have already delayed the design, development, and production schedules by several months.

These budgetary constraints led the Department to a quick, prudential analysis of a possible alternative to the B61–12 that would provide the military and deterrent characteristics of a gravity bomb. This analysis was not intended to substitute for the previous

efforts in judgment of the Nuclear Weapons Council, but to take an objective look at other options during a period of at least short-term budgetary churn. If nothing else, this study served to validate the Department's commitment to the program, and, in fact, it quickly demonstrated that there is not a cost-effective alternative that meets military requirements and policy objectives of the B61–12 LEP.

Both Departments and the administration remain firmly committed to the 3+2 strategy and the long-term fiscal and national security benefits that it presents.

Finally, let me make an important comment about the B61's roles. As I previously mentioned, under the current modernization strategy, the B61–12 will become the only gravity bomb in the U.S. inventory for both the strategic bomber and the dual-capable aircraft fleets. The B61–12 will also be a critical part of NATO's nuclear deterrent, and it is equally important to our allies in Asia. This LEP will reassure our nonnuclear allies and partners that their security interests will be protected, leaving no need for them to develop nuclear-deterrent capabilities of their own.

I cannot emphasize this point enough. The B61–12 is critical to U.S. nuclear deterrence and is viewed by the administration and others as the cornerstone of our extended deterrence commitment to allies around the globe.

Thank you.

[The prepared statement of Secretary Creedon can be found in the Appendix on page 36.]

Mr. ROGERS. Secretary Creedon, I very much appreciate that statement.

General Kehler, you are up. Five minutes.

STATEMENT OF GEN C. ROBERT KEHLER, USAF, COMMANDER, U.S. STRATEGIC COMMAND

General KEHLER. Thank you, Mr. Chairman, Ranking Member Garamendi, distinguished members of the subcommittee. I am pleased to be here as well with all of you today and my colleagues to discuss the B61 Life Extension Program and how it fits within a broader operational and stockpile strategy.

Mr. Chairman, our Nation's nuclear forces perform three key functions. First, they deter potential adversaries via credible nuclear capabilities and effective plans; second, they assure our allies and partners of our extended deterrence commitments to them; and third, in the unlikely event deterrence fails, they achieve national security objectives as directed by the President.

To accomplish these functions, the Nation requires a safe, secure, and effective nuclear force composed of well-trained people, modern nuclear delivery systems and warheads, an assured command-and-control network, and the highly specialized infrastructure necessary to sustain them.

I am 100 percent confident in the ability and dedication of our people and the operational viability of today's nuclear force, but aging issues exist, and I remain concerned that the force requires significant investment in the midst of a very difficult financial period. The investments we request are guided by a policy-based, long-term strategy and implementation plan that will allow us to

sustain the nuclear triad of delivery vehicles, enable critical improvements to our national command-and-control systems, and systematically extend the life of essential weapons in the stockpile to meet our military needs.

The 3+2 strategy that Secretary Creedon mentioned, which is so named because it will ultimately result in three updated ballistic missile warheads and two updated air-delivered warheads, allows us to retain a highly effective and sustainable nuclear stockpile to address 21st century threats and uncertainty. From my military perspective, the 3+2 strategy underpins all of our initiatives to meet the new national guidance issued by President Obama last June, and the B61 Life Extension Program is the next critical step within that strategy.

There are several reasons why I believe this is to be true. First, our recently updated nuclear employment guidance directs us to retain a triad of nuclear delivery vehicles, and that is, of course, a construct that continues to provide the Nation with a deterrent that is responsive, survivable, and flexible. The current and future nuclear bomber force is a key component of the triad, and arming that force with a life-extended B61 and eventually with a follow-on to the air-launched cruise missile is a top priority.

Second, the life-extended B61–12 is envisioned to be the only nuclear gravity weapon in the future arsenal. The B61–12 LEP will extend the weapon's safety, security, and effectiveness for decades and consolidate multiple variants into a single design, which offers opportunities for significant stockpile reductions, while maintaining national security objectives and extended deterrence commitments.

Third, the meaningful work being done on the B61 can be leveraged for future life extension programs and provide the impetus to develop and retain the critical workforce skills the United States needs to sustain its deterrence force.

Importantly, the B61–12 Life Extension Program has been optimized in both scope and timing to match the throughput capacity of the nuclear industrial complex. Failure to conduct this life extension now will discard that leverage and increase costs of future life extension programs.

Finally, the B61 is the only weapon in the stockpile that can arm both the B–2 bomber and dual-capable fighter aircraft deployed by the U.S. and NATO in Europe. As such, it contributes greatly to the foundation of U.S. extended deterrence around the globe. Extending the life of the B61 will reassure our allies and partners and will further our nonproliferation efforts.

I continue to endorse the 3+2 strategy and give my strongest support to the B61–12 Life Extension Program, but I remain concerned that these substantial modernization efforts come in the midst of this difficult financial period. In my view, the need for sustained investments increases as we decrease the number of deployed weapons to New START [Strategic Arms Reduction Treaty] levels. From a military perspective, smaller numbers of weapons means that the quality and reliability of each weapon must be high.

As we face budgetary constraints, we will examine and pursue every possible alternative to drive costs down, but we must stay the overall course that we have set to the maximum possible ex-

tent. The B61 LEP is the next step to sustain our deterrent force, and I ask for your continued support.

Thank you, and I look forward to your questions.

[The prepared statement of General Kehler can be found in the Appendix on page 43.]

Mr. ROGERS. Thank you. Very well done.

Dr. Cook, you are recognized for 5 minutes.

STATEMENT OF DR. DONALD L. COOK, DEPUTY ADMINISTRATOR FOR DEFENSE PROGRAMS, NATIONAL NUCLEAR SECURITY ADMINISTRATION

Dr. COOK. Chairman Rogers, Mr. Garamendi, and distinguished members of the subcommittee, I also thank you for having me here to discuss the President's plans for nuclear weapon modernization that are focused on the B61 Life Extension Program and the NWC [Nuclear Weapons Council] strategy, 3+2, as has already been described.

I am also pleased to be here with my colleagues. And I want right off to thank you for your continuing and ongoing support of the men and women of the National Nuclear Security Administration across the country, the work that they do, and your bipartisan leadership of some of the most challenging national security issues of our time. This support has helped keep the American people safe, it has assured our allies, and it has enhanced global security.

I am here today to state how critically important it is for the United States to have an unambiguous and effective strategy to achieve the goals articulated very clearly by the President, first at Prague in 2009, again in the 2010 Nuclear Posture Review, and most recently in Berlin this June, to ensure a safe, secure, and effective deterrent, while reducing the number and types of nuclear weapons. That national strategy is the 3+2 strategy advocated by U.S. Strategic Command, endorsed by the Nuclear Weapons Council, and with congressional support, will be implemented by the NNSA and the DOD services.

I would like to take a moment to discuss an integral part of the 3+2 strategy, which is the B61, and why your continued support is essential to achieve a significant reduction in our stockpile of nuclear bombs, while meeting the President's commitment to maintain a safe, secure, and effective arsenal to deter any adversary and to guarantee that defense to our allies. I will not go through further details on the 3+2 strategy, because that has already been covered.

I would like to emphasize the United States has already reduced the size of our nuclear stockpile very substantially, by more than 80 percent since its peak during the cold war. Today we have the smallest stockpile since the Eisenhower administration. The interoperability provided by implementing the 3+2 strategy you have heard discussed will allow the United States to reduce further its hedge against technical failure and geopolitical surprise, while maintaining an effective deterrent through a balanced and flexible stockpile.

So on the B61, the B61 is one of the oldest nuclear weapons in a stockpile that has never been older, and it requires the refurbishment of some of its components in order to remain viable for years

to come. The B61 has major strategic and tactical requirements, to which the DOD will speak further, and from the NNSA perspective, we are charged with maintaining the health of the B61 variants currently in the active stockpile and also conducting the life extension program on this important aspect of our nuclear deterrent.

On February 12—I am sorry, February 27, 2012, the NWC authorized the U.S. Air Force and NNSA to begin Phase 6.3 engineering development for the B61–12 LEP. This LEP will consolidate all of the existing B61 variants, also known as mods 3, 4, 7, and 10, into the mod 12 to provide both strategic and extended deterrence for an additional 20 years following the first production unit in 2020.

Regarding the NWC process that led to the decision to choose the final scope of the 61–12 LEP, I would like to be very clear that the resulting decision supported the lowest-cost option that meets threshold military requirements. For 3 years, from 2010 to 2012, the NNSA, in consultation with the NWC, evaluated four major options for the 61 LEP, with many suboptions beyond that, before selecting the current 61–12 design approach. The chosen option, known as Option 3B, maximizes the reuse of both nuclear and nonnuclear components, while meeting the needed design life. The option foregoes the newest surety technologies and instead improves security and safety of the bombs using somewhat older, but proven technologies.

And although two of the other options had lower initial costs, their life cycle costs were higher, not as—as a result of not addressing all known aging concerns. Because of this, these two options would necessitate starting another life extension program after initial alterations in order to address the remaining concerns.

Now, lastly, I would say the 61–12 LEP is really making good progress. We are in the second year of full-scale engineering development. The program has met its development milestones, it is on schedule, and it is on budget. Today the most significant risk the program faces is not technical risk, but uncertainty of consistent funding. However, because of the demonstrated success we have had to date, confidence from U.S. Strategic Command and the Nuclear Weapon Council has been sufficient to expand planning for the consolidation of nuclear bombs by including the future retirement of the B83 in the overall strategy.

This allows, in summary, for a reduction in the total active and inactive number of U.S. nuclear gravity bombs by a full factor of two within a few years after completion of the 61–12 LEP. And the reduction in numbers of bombs and the decision to use the lowest-yield variant from today's stockpile can reduce the total amount of special nuclear material in the total active and inactive number of gravity bombs by more than a factor of six. That is 80 percent.

So in summary, I want to thank you for your support thus far and get on to the questions.

[The prepared statement of Dr. Cook can be found in the Appendix on page 51.]

Mr. ROGERS. Thank you very much, Dr. Cook.

Dr. Hommert, you are recognized for 5 minutes.

STATEMENT OF DR. PAUL J. HOMMERT, PRESIDENT AND LABORATORIES DIRECTOR, SANDIA NATIONAL LABORATORIES

Dr. HOMMERT. Chairman Rogers, Ranking Member Garamendi, and distinguished members of the Strategic Forces Subcommittee, thank you for the opportunity to testify here today.

First I would like just to take a moment to congratulate General Kehler on his upcoming retirement and thank him for his leadership of the Strategic Command. He has been a great partner for those of us in the nuclear security arena. Thank you.

My testimony today will focus on the B61 warhead system and the B61 Life Extension Program. In this regard I would like to make the following key points. In order to sustain high confidence in the safety, security, and reliability of the B61 into the next decade, it is our technical judgment that we must complete the life extension program currently being executed. I make this statement for reasons that have been documented in annual assessment letters by me and my predecessor for a number of years now, all having to do either with technology obsolescence or aging, not surprising for a system the oldest units of which were manufactured and fielded in the late 1970s with some components dating to the 1960s.

Second, we are well into the full-scale engineering development phase of the life extension program, with the baseline design review now scheduled for September 2015. This program addresses all known aging or technology obsolescence issues, as I can illustrate by a comparison of 1960s vintage vacuum tubes now in our stockpile to be replaced by modern integrated circuit technology in a radar now tested successfully, and is the minimum program that addresses the threshold requirements that have been provided to us by the Department of Defense and the NNSA.

To date, we have costed $253 million of the $2.65 billion estimated incremental costs for Sandia on the B61 LEP through the completion of production, which was specified in the weapon development cost report provided in June 2012. Furthermore, at Sandia we met all major fiscal year 2013 program milestones for the B61 LEP on or under cost, although sequestration caused some of the work scope to be deferred to fiscal year 2014.

We have put in place rigorous project management expertise to ensure ongoing adherence to the plan for all our modernization efforts. We have drawn upon resources and expertise nurtured through our interagency work on broader national security challenges at our laboratory to meet the urgent demands of our core nuclear weapons mission, most notably staffing; however, the impacts both to schedule and life cycle costs of ongoing fiscal year 2014 budget decisions have yet to be established. And I have to say, from what I know now, it is likely they will have impact on schedule and potentially on cost.

Finally, let me just end with more of a personal note. In a professional career now spanning some 37 years, I have had the extraordinary privilege to work at three institutions whose core responsibility is nuclear weapons: the Atomic Weapons Establishment in the United Kingdom, the Los Alamos National Laboratory, and, of course, Sandia National Laboratories. In that time I have worked with many exceptional individuals who have dedicated their profes-

sional lives to the innovation, science, and engineering excellence required to ensure that these unique devices of mankind are safe, secure, and reliable.

I fully recognize the fiscal environment in which we are operating, and throughout my written testimony I have indicated our focus on cost management and cost efficiency; however, my experience deeply reminds me that nuclear weapons are the last place for half measures or corner cutting.

Thank you for your support, and I look forward to your questions.

[The prepared statement of Dr. Hommert can be found in the Appendix on page 59.]

Mr. ROGERS. Thank you very much, Dr. Hommert, for that comment and for your service.

We are moving into questions now, and I want to start with my questions. You heard me make reference in my opening statement to some misinformation in the public discourse about this, and one is a New York Times editorial from May, and which I will read without objection. The editorial says, "...many experts doubt that the B61 warheads need to be rebuilt now, if at all. Government-financed nuclear labs have a rigorous program protecting them to make sure that they still work," close quote.

Dr. Hommert, you are the director of one of those government-financed labs, and the government pays you to be the expert to inform us as to whether or not we can ensure the safety, security, and reliability of these weapons. Do you agree with the New York Times observation in that editorial?

Dr. HOMMERT. I agree that we have a rigorous program to attest and evaluate these annually. We certainly do that. And it is, in fact, that program that has provided the basis of information that leads me to make the statement I made. There are physical processes occurring in these weapons that we see across a number of arenas, from decay, isotopic decay, to polymers, to HE [high explosive], that all together require that we execute this life extension program.

Mr. ROGERS. So you are saying that you don't agree with their observation that we don't need to take action on the B61 now, if at all?

Dr. HOMMERT. Absolutely. I categorically disagree with that statement.

Mr. ROGERS. Great.

Dr. Cook, let's briefly discuss the editorial statement that "when all is said and done, experts say the cost of the rebuilding program is expected to total around $10 billion—$4 billion more than an earlier projection." You provided us a written explanation in the documents I previously introduced for the record, but please walk us through the cost history here. What figure do you stand behind for what this LEP will cost? We hear a lot of misinformation on what the LEP is going to cost.

Dr. COOK. Sir, I stand behind the first baseline provided under my signature formerly to the Congress, which is called a selective acquisition report. I entered that in May of 2013, just this year, and that was once we are into full-scale engineering design and after some time, this is a legal requirement. I have updated that

once already in a following quarter and am ready to do that in the second quarter.

With regard to the costs, the $4 billion number is often thrown around as some kind of a baseline. That was never a baseline. We had a very initial position in a budget several years ago that said we believe that the cost will be at least in the $4 billion range, and we prepared, as we usually do then, to undertake the work. At that point, no engineering work had been done, no design work had yet been—begun on the B61, and with a predecessor system, the W76, we were not yet into stable manufacturing. So it was a placeholder, and nothing more than that.

As we went through the Nuclear Weapon Council deliberations, and over the course of the years which I mentioned, 2010, 2011, and 2012, we evaluated quite a number of options. The council ultimately selected Option 3B. The weapon design and cost report came out after we moved from the consideration of alternatives and Phase 6.2 into engineering development, which is Phase 6.3. That report was issued, and aside from the costs that were in that report, we have added only management contingency. The details remain the same.

One additional effect, though, was caused by sequestration, and that struck in March of this year. That caused the first production unit to be slid out in schedule by 6 months, from 2019 to March of 2020, and it caused us to increase the cost estimate by $244 million simply because of that single sequestration event.

Mr. ROGERS. Okay. General Kehler, is there a "reduced scope" option that meets minimum military requirements and costs less than the B61–12 design that is currently being pursued in this LEP?

General KEHLER. Mr. Chairman, I don't think there is any longer. At one time we looked at some options in the Nuclear Weapons Council. Early on it appeared that there might be a lower-cost option that these gentlemen to my left are more than prepared to discuss. The farther we have gone down the road in investigating the scope of work that needs to be done, as I look at this today, there is not a minimum option that is going to fulfill all the military requirements that we have laid on.

Mr. ROGERS. Great. Thank you.

Secretary Creedon, the editorial calls the administration's decision to pursue the B61 LEP, quote, "a nonsensical decision, not least because it is at odds with Mr. Obama's own vision," close quote. It further states, quote, "Mr. Obama advocated the long-term goal of a world without nuclear arms and promised to reduce America's reliance on them. He also promised not to build a new and improved warhead."

Secretary Creedon, what do you think of this statement by the Times? Is the B61 contradictory to the President's visions and goals?

Secretary CREEDON. No, sir. It is absolutely consistent with the President's goals. It is very important to remember that there are sort of two—two points to all this. One is that he has been very strong that the stockpile remain safe, secure, and reliable, and that that remain that way as long as there are nuclear weapons.

That said, he clearly has indicated that he would like to entertain reductions, and that he would like to entertain these reductions along—along with Russia, but until such time as that happens, it is absolutely consistent, the B61–12 is absolutely consistent, with the President's goals as well as our commitments to our allies.

Mr. ROGERS. Thank you. And thank all the witnesses.

I yield now to the ranking member for any questions he may have.

Mr. GARAMENDI. We are going to spend a considerable amount of money on the B61–12 program, but before we get into that, why do we need the B61? General Kehler.

General KEHLER. Sir, our requirement to deter nuclear attack is a military mission. This B61 weapon arms the B–2, it will arm the future long-range strike platform, it arms the current dual-capable aircraft that are forward-stationed in Europe as well as those of our NATO allies that maintain dual-capable aircraft, and it is the candidate weapon to arm the F–35 in that dual-capable aircraft role.

It is about deterring, it is about assuring our allies of our extended deterrence commitment to them, and, from a military standpoint, it is about being able to offer the President a series of options that include nuclear options in extreme circumstances as among those from which he can choose.

Mr. GARAMENDI. Are there other gravity bombs available to achieve this same task?

General KEHLER. There is another gravity weapon today. It is the B83 gravity weapon. It is different than the B61. We have looked very carefully at whether—and technically you could use the B83, so don't let me mislead you. You could certainly use the B83 to arm the B2, and we have looked at that, but on balance, when we look at the combinations of features that are associated with both of these weapons, and we look at the appeal of the B61 as a candidate to incorporate all the best features as we go forward, we have come to the conclusion that both from a military standpoint and from a standpoint of future safety, security, and surety in the stockpile, that the B61 is the best of the choices to go forward.

Mr. GARAMENDI. So there is another bomb, the B83; is that what you said?

General KEHLER. There is.

Mr. GARAMENDI. That could achieve the same purpose?

General KEHLER. It is a gravity——

Mr. GARAMENDI. What are its shortcomings?

General KEHLER. It is a gravity weapon, but over the long term, we think that it has some shortcomings that——

Mr. GARAMENDI. Which are?

General KEHLER. Well, one, is it has a very high yield, and we are trying to pursue weapons that actually are reducing in yield, because we are concerned about maintaining weapons that—that would have less collateral effect if the President ever had to use them, which may sound——

Mr. GARAMENDI. Yes, it does sound like a strange way to use collateral effect on a nuclear weapon, but go ahead.

General KEHLER. Well, however, there is a direct relationship between yield and collateral damage.

Mr. GARAMENDI. I am sure there is.

General KEHLER. And so——

Mr. GARAMENDI. And with a lot of collateral damage at the outset.

General KEHLER. Without getting too "Strangelove-y" in here, I think that the fact of the matter is that for the B83 and the B61, when you stack them next to one another, and you look at both their current capabilities to meet military requirements and their future potential to be the investment of choice as we go to the future, the B61 has come out on top.

Mr. GARAMENDI. Does the B83 need to be—have life extension?

General KEHLER. It will eventually, but not in the same pace as the B61. It is not necessary immediately.

Mr. GARAMENDI. When would it have to have the same kind of extension?

General KEHLER. I will defer to my colleagues down the table.

Dr. HOMMERT. There will have to be some—how could I say it—a smaller adjustment to its subcomponent system in the next decade involving generators and gas transfer. That is a much smaller-scope activity, but that has to occur. A full-scale LEP, at least of the magnitude here, would not be needed for over a decade.

Mr. GARAMENDI. There is some information that the B61 would be scheduled for a new LEP in 2033; is that correct?

Dr. COOK. That comes directly out of the Stockpile Stewardship and Management Plan, which we have issued regularly and did so this year. The logic here is that it takes about 10 years to conduct a life extension program, and if you look at the B61, by the time we get to first production unit, it will be about 10 years.

The lifetime of the weapons that we put in the arsenal is about 20 years, and so about 10 years after one weapon is inserted into service, a life extension program would be needed to begin to put new systems in, replace systems in 20 years after the initial one. That is what the logic comes from.

Mr. GARAMENDI. Dr. Hommert, when would the B83 have to be—have its life extended?

Dr. HOMMERT. Well, again, it will have—it has a couple of components that we would have—we have to do work on in this decade, right? At some point it will begin to face some of the same aging issues we now see in the 61, but that is certainly not for another decade or more. All right?

Mr. GARAMENDI. So going at this from the beginning, like asking the question why, I am going to pursue it a bit. If I understand, General Kehler, there is another gravity bomb called the B83 that has a deficiency in that it is too powerful. Are there any other deficiencies?

Mr. GARAMENDI. It is about flexibility for us as we look to the future. The weapon is not as flexible as the B61.

Mr. GARAMENDI. What does "flexible" mean?

General KEHLER. In terms of our ability to use various yields that would be matched to the targets.

Mr. GARAMENDI. Does the B61 have variable yield?

General KEHLER. It does at the lower end, yes, sir.

Mr. GARAMENDI. And the B83, Dr. Hommert, does it have a variable yield?

Dr. HOMMERT. Yes.

Mr. GARAMENDI. So both have variable yield, but one is at a higher variability, and the other is at a lower variability. So flexibility has to do with the size of the explosion; is that right, Dr. Cook?

Dr. COOK. Let——

Mr. GARAMENDI. Or wherever else you want to go, so——

Dr. COOK. Let us see. I am trying to provide some information to answer your question.

Mr. GARAMENDI. Thank you.

Dr. COOK. So in my remarks I said that we have agreement that a B61–12 LEP suitably conducted could replace the B83, which is the last megaton gravity bomb. So I am supporting what General Kehler said. There is considerable difference in collateral damage between the yield of a much smaller weapon. And these yields are classified, so we cannot describe them here.

Mr. GARAMENDI. I understand.

Dr. COOK. But I should also emphasize that the B83 is not currently compatible with NATO aircraft nor with fighters of the U.S., and so if one wanted to go down a different path, and my recollection says that the life extension for the B83 comes due to begin in a period of about 15 years or less.

Mr. GARAMENDI. The B61, is it compatible with the——

Dr. COOK. It is compatible.

Mr. GARAMENDI. The LEP on the B61 is to make it compatible with future bombers and the F–35; is that correct?

General KEHLER. Right. Right. The B61 is compatible with all of the aircraft that I mentioned, and it will be made compatible with the future aircraft as well. The B83 is not.

Mr. GARAMENDI. So the B83 could not be used for the F–35?

General KEHLER. I would have to get that answer specifically for the record for you. I think I know the answer, but I don't want to speculate.

[The information referred to can be found in the Appendix on page 113.]

Mr. GARAMENDI. I think you know where I am going with the questions. I am going to a $12 billion question here. Do we really need the B61 modified? Does the B83 suffice? Presumably this entire discussion has to do with deterrence, not with the tactical.

General KEHLER. Well, yes, sir, except I would offer deterrence is about the credibility of the military force that is used to carry it out, and so we have always made sure that our deterrence statements are backed with credible military forces. That includes reliable weapons, that includes trained people, plans to use them if we needed to, et cetera. And so just having the weapons isn't enough, we don't think, to say that we have a credible deterrent.

Mr. GARAMENDI. Well, thus far in the discussion—excuse me, Mr. Rogers. I am going to wrap up in just a very few seconds here.

The discussion thus far would indicate that we do have a B83 bomb that works. It is going to need some modifications that are apparently not terribly expensive and achievable in the short term; is that correct, Dr. Hommert?

Dr. HOMMERT. Yes. Those modifications are planned, yes.

Mr. GARAMENDI. I am sorry. They are?

Dr. HOMMERT. Yes. They are planned to be executed over the next decade, yes.

Mr. GARAMENDI. So they are already in the process of being determined.

The question has to do with the deterrent. Apparently the B83 can be delivered by the current strike bombers?

General KEHLER. Can be delivered by the B2.

Mr. GARAMENDI. B2.

General KEHLER. I am not 100 percent sure. We will get for the record whether it can be delivered, for example, by the F–15E. I don't believe it can, but I don't know that for sure. I need to get that for the record.

[The information referred to can be found in the Appendix on page 113.]

Mr. GARAMENDI. I think I have gone about as far as I can go in this format.

General KEHLER. And if I could add another thing. Yes, we are currently planning to do some things to the B83. Until we get to the point where we have gone far enough in the B61 LEP, we intend to reduce the numbers of B83s and then eliminate the B83. That is what we will do. So we are not spending money twice here.

Mr. GARAMENDI. I understand that would be wise, but on the other hand, if the B83 is good with some repairs over the next decade or more, why do we need the B61? Dr. Cook.

Dr. COOK. From a technical perspective, since NNSA and its labs and plants design, develop, qualify, manufacture, certify these weapons and then place them into the hands of the DOD. Let me emphasize that the intent with the B61–12 is to replace the current mods 3, mod 4, mod 7, mod 10, and because we are in the second year of full-scale engineering, about to enter the third, we have built sufficient confidence among the nuclear weapon complex member units to retire the B83. If we did not do that, and we will need to do a life extension of the B83, I—you know, I said it will be not sooner than 10 years, but not longer than 15 years. It will be a larger life extension. It will be more expensive. We will have to do compatibility with aircraft which don't currently fly it, and we will not have the basis to do that at anywhere near the cost of the B61–12. All I can say right now is it would be considerably more expensive, in my opinion, my technical opinion.

Mr. ROGERS. Thank you. We are going to be—call for votes in about 10 or 15 minutes, so——

Mr. GARAMENDI. Thank you, Mr. Chairman.

Mr. ROGERS. Thank you.

Mr. Garamendi asked a great question, and I thought everybody covered it in their opening statements, but I want to give each one of you a chance to restate it. In your professional opinion, do we need to move forward with the B61 LEP, yes or no? Ms. Creedon.

Secretary CREEDON. Yes. And I want to add a policy take on this——

Mr. ROGERS. Okay.

Secretary CREEDON [continuing]. For just a second. One of the things with respect to the B83 is it is—it truly is a megaton-class

weapon. It is the relic of the cold war. And when we look at the forward-deployed B61s and what a B61–12 would provide for us, particularly in Europe, the B83 is not compatible with the European aircraft, and the idea of introducing a megaton warhead into Europe is almost inconceivable to me at this point. So——

Mr. ROGERS. Thank you.

Secretary CREEDON [continuing]. We need the 61.

Mr. ROGERS. General Kehler, your professional opinion. Do we need to move forward with the B61?

General KEHLER. We do need to move forward with the B61. We have looked across the B61 and B83 and come to the conclusion that that is the best way forward.

Mr. ROGERS. Great.

Dr. Cook.

Dr. COOK. Yes.

Mr. ROGERS. Dr. Hommert.

Dr. HOMMERT. Yes.

Mr. ROGERS. Great. Obviously you all aren't lawyers. The lawyer has to expound upon it. Thank you very much.

The gentleman from Colorado is recognized for 5 minutes.

Mr. LAMBORN. Thank you, Mr. Chairman.

And you all have a key role in helping to maintain our deterrent, and I want to thank each and every one of you for the work that you do. And, General Kehler, you in particular, you are about to retire. I met you first in Colorado Springs, and you went on to Omaha from there, and I just want to say I appreciate your career and your service to our country. Thank you.

General KEHLER. Thank you.

Mr. LAMBORN. And I will come back to you for a question, if I can, but first, Dr. Cook, I would like to ask you briefly about the production plants being brought in with the fiscal year 2014 budget requests, including Y–12 and Pantex. And these two plants have been operating under short-term contract extensions for nearly 3 years. There have been some bid protests. This must be distracting for the workforce there.

So are you concerned about the plants being able to retain and attract quality personnel under these uncertain circumstances, and do you think the Department will consider cancelling the RFP [request for proposal] and taking the time to redo the contract?

Dr. COOK. You had two parts of a question. First part, yes, I am concerned about the health and well-being of the workforce no matter where they are, the labs, the plants, and Nevada.

Second part of the question, with regard to contractual things, I cannot answer. I could say there was a statement yesterday about the timing in which NNSA intended to award a contract. I would refer you to that, but I don't have any personal knowledge.

Mr. LAMBORN. Okay. Thank you.

And, General Kehler, let me ask you and Secretary Creedon about—and this builds on a question that the chairman asked a few minutes ago about the B61–12. I know one of the options that was considered, and I—it is displayed on this posterboard over here was the "Triple Alt" [alteration] option. How do those two compare? How does the Triple Alt compare to the B61–12 option, especially

looking at cost and important factors like that? Either one of you, or both. Both of you.

General KEHLER. I will start, sir, and then ask, again, my colleagues from NNSA to really describe the differences. But, again, when we entered the conversation about what we had to do with the B61 initially, there was an alternative that was proposed that would have done only the most critical things that we thought existed, the problems that we thought existed at the time. One of those—and this is an unclassified hearing, so we can provide more details for the record—but one of those was radar, and——

Mr. LAMBORN. Is that on the Triple Alt line, that row on the top there?

Dr. HOMMERT. Radars, yes.

General KEHLER. It is. Don, if you want to——

Mr. LAMBORN. Can you see that okay?

Dr. COOK. May I just address a couple—some comments on the chart for everybody here? The Triple Alt covers three critical components that do need to be improved. Dr. Hommert can speak more about each of these. The first is radar, second is the power supply, and the third is neutron generators. Although there is no immediate life-threatening—meaning in the next year—issue on B61 in these components, they all have long-term issues. So if you look at all of the other categories of the decisionmaking, you can see that falls in red block.

There are issues with that specific LEP that are not resolved, and one of those is there is a degradation in warhead electronics internal to the bomb in its present radiation environment.

If you look at the next option, the 1E option would solve what I just mentioned, that is, internal electronics, but it would be constrained only to nonnuclear life extension program. And so we would not do any fixes to the nuclear explosive package, primary, secondary or interstage, and we would have to come back and address those units in a separate LEP. So with a 1E, first we would do, you know, a nonnuclear LEP, and then we would have to come back to do a nuclear LEP. That would be a more expensive approach. If you look at the nonnuclear portion, the first portion only, well, that is less expensive than the 3B. But if you look at both, it is more expensive, so that is why I address the full through-life cost.

You can see option 3B is the first option that meets all of the requirements. And when we said meets minimum requirements, you can see option 2C. Anywhere there is a B or a C, you can imagine there were A's, there were other variants. This is just a short rendition of the options. Option 2C, though, made step improvements in safety by having direct optical initiation, so no electrical connection to the detonators, and multipoint safety, too detailed for this hearing. We chose, though, not to take that option because it was more expensive.

Mr. LAMBORN. So it is your opinion that of all the four options, 3B is the best one by far? Well, it addresses all of the issues after detailed and extensive analysis?

Dr. COOK. That is correct. Not only that, it has the lowest through-life cost of all of these options listed.

Mr. LAMBORN. And you all would agree with that?

Dr. HOMMERT. Absolutely.
Mr. LAMBORN. Thank you.
General KEHLER. Yes.
Mr. LAMBORN. Thank you very much.
Mr. ROGERS. The gentlemen's time has expired.
The gentlelady from California, Ms. Sanchez, is recognized.
Ms. SANCHEZ. Thank you, Mr. Chairman. Thank you.
So first, Mr. Chairman, I would like to submit for the record some letters, I know that you have already received them, from a lot of other Parliamentarians from other countries, in particular our allies, who are asking us that the modernization for the deployment of the B61 is a waste of resources for both the U.S. and the particular countries they come from, many of them. I would like to put it into the record.
Mr. ROGERS. Without objection, so ordered.
[The information referred to can be found in the Appendix beginning on page 85.]
Ms. SANCHEZ. Mr. Chairman——
Mr. TURNER. Will the gentlelady yield for just one moment, kindly? I had received a similar letter when the members of the NATO Parliamentary Assembly were in from—Raymond Knops, a member of Parliament from the Netherlands, to which we responded, detailing the specific issues that related to the letters that you are entering into the record.
With the chairman's consent, I would like to introduce that letter.
Ms. SANCHEZ. Sounds great.
Mr. TURNER. Also as—as——
Ms. SANCHEZ. Sounds great. I would like to have it into the record.
[The information referred to can be found in the Appendix beginning on page 108.]
Mr. TURNER. Thank you. And then we would also——
Ms. SANCHEZ. Now reclaiming my time, please.
Mr. TURNER. Thank you.
Ms. SANCHEZ. Mr. Chairman——
Mr. ROGERS. Your choice.
Ms. SANCHEZ. Okay. Because I didn't give him the time, you did. You gave away my time, Mr. Chairman.
Mr. ROGERS. We all have our faults.
Ms. SANCHEZ. So I want to talk about the deterrence value and the military value, because I remember General Cartwright saying something to the effect of we lose no military value if we don't have the B61.
So my question to the general and to Secretary Creedon is how much have our allies contributed to the cost of the B61 Life Extension Program? Has potential withdrawal or other measures to provide reliable extended deterrence been discussed in consultation with NATO capitals? Why or why not? Is it possible to provide reliable extended deterrence without forward-deploying the B61? And have you discussed NATO contributing to the B61 LEP programs?
And this all comes from the whole issue of Cartwright saying we have other military things that take care of this whole spectrum—basically, that is what he has said to us—and this is more of a po-

litical value. So can you speak to the three or four questions I put forward before you?

Secretary CREEDON. Thank you. First let me take the value of the 61 to our NATO allies.

I have the privilege of chairing what is referred to as the High Level Group, which is an interesting name, but it is a senior NATO group that deals with nuclear policy in the context of NATO, and it reports to the defense and foreign ministers sitting in what is referred to as the Nuclear Planning Group format. And it is a long-standing NATO committee, and one of the things that that committee looks at is nuclear policy within NATO, including political guidance.

And the High-Level Group just completed, over the course of the last year and a half, a whole review on what exactly nuclear policy in NATO should be. It was initially reflected in the NATO Defense Posture Review, which was——

Ms. SANCHEZ. So you are eating up my time here.

Secretary CREEDON [continuing]. 2012, but it said NATO will remain a nuclear alliance for as long as nuclear weapons exist.

Ms. SANCHEZ. Are they providing money——

Secretary CREEDON. Yes, they are.

Ms. SANCHEZ [continuing]. For this life extension?

Secretary CREEDON. So not——

Ms. SANCHEZ. How much? What percentage?

Secretary CREEDON. So not for the life extension itself.

Ms. SANCHEZ. No. Have they provided money for the——

Secretary CREEDON. It is a——

Ms. SANCHEZ [continuing]. Life extension?

Secretary CREEDON. The life extension——

Ms. SANCHEZ. This is what we are concerned about here.

Secretary CREEDON. The life extension, it is the life extension for a U.S. weapon. As a U.S. weapon, the U.S. pays for the life extension program.

Ms. SANCHEZ. So they are not; so they are not putting their money where their mouth is.

Secretary CREEDON. NATO contributes and has contributed over 170 million euros, and NATO provides for the security. The host bases provide for the security, and also they also provide all their own aircraft. So there is a——

Ms. SANCHEZ. Ms. Creedon——

Secretary CREEDON [continuing]. Substantial NATO contribution.

Ms. SANCHEZ. Ms. Creedon, I would like to ask you another question since you kind of ate up my time there, and I am now a minute or under. Also Mr. Chairman did, or actually——

Mr. ROGERS. The gentlelady is allowed 38 seconds to make up——

Ms. SANCHEZ. Do you know exactly how much the Department of Defense spends for maintaining and deploying nuclear weapons? Would including personnel costs in understanding which bases are counted provide a more accurate estimate of the full costs of nuclear? Can you give us a cost estimate of what it costs to do these things?

Secretary CREEDON. We can give you the personnel costs, we can give you O&M [operation and maintenance] costs. We have done

over time various estimates as the cost for DOD of maintaining the nuclear weapons and delivery systems.

Ms. SANCHEZ. Because I asked for this in fiscal year 2013. It was taken out. I have asked for it in fiscal year 2014. NDAA goes forward. Would you support figuring how much it is really costing us to do this?

Secretary CREEDON. We can provide those figures. I mean, we can certainly provide the figures.

Ms. SANCHEZ. Perfect.

I will end on time, because I know we have got votes on the floor, Mr. Chairman. Thank you. Thank you.

Mr. ROGERS. Thank you.

The chair now recognizes the gentleman from Louisiana, Dr. Fleming, for 5 minutes.

Dr. FLEMING. Thank you, Mr. Chairman, and thank you, panel.

I am going to turn the question around a little bit, and I will start with General Kehler, but others can answer. What if we descoped or cancelled? And I get what you say about the flexibility, and that makes perfect sense to me about the B61 LEP program, but what if we didn't do that? What would be the result? What would we find in the following years for not moving forward with that?

General KEHLER. Sir, the reliability of the deterrent continues to decline. As you heard our colleagues from the Department of Energy say, these, the weapons, almost across the board now, are approaching 20-plus years of lifetime, some of them older than that. In some cases they are based on components and designs that are older than that. And so from my perspective, what we watch very carefully is the reliability when we do nonnuclear explosive testing on the weapons and component surveillance testing, the things that the labs do to talk to us about the weapons that provide us with an annual way to look at the viability of the stockpile.

The trend is for reliability to continue to decrease unless we take the actions that we are laying out here in our strategy. So in every case here, there are components in our weapons that must be addressed. If we don't address those, then we have reliability issues. At some point in time, we will have to—we have weapons that what we call "turn red." That is not a safety issue, but that is a performance issue. So we don't want to put the country in a place where, as long as we are asked to provide the nuclear deterrent, that we can't do that with weapons that are credible.

Dr. FLEMING. Yeah. General, would that then create a situation where a future President in outyears and when that reliability begins to decline, in a certain situation certain options would be taken off the table, and he or she may have less choices; we might even have to choose a conventional solution that might be inadequate simply because we don't have the flexibility of that upgrade and the modernization?

General KEHLER. Sir, I think that that is clearly an issue, and I do agree with what you just said. I think that you could—you could be removing options and flexibility from a future President.

I also think that there is impact on our ability to deter those kinds of uses to begin with. The ultimate objective of the nuclear

deterrent is to make sure that the weapons are never used, and yet we use them every day——

Dr. FLEMING. Yes.

General KEHLER [continuing]. To do that. It is almost counterintuitive, from people who aren't informed, but we use those weapons every single day. The credibility of our deterrent depends on the credibility of the weapons and the forces and the people that are associated.

Dr. FLEMING. Okay. Well, then, let me ask this, and, again, anyone on the panel is welcome to answer this question. In moving forward with our LEP and what we learned from doing that, the technology developed, how can that be expanded to other modernization programs or other programs in general? Yeah. Dr. Hommert.

Dr. HOMMERT. Yeah. From the outset as we have gone into this LEP, we have looked at as many components that we can do here. The radar is an example. This radar will go into two additional LEPs. There are also devices that—you can think of them as switches, but highly specialized switches, which assure safety. Those that will go into the 61 will also be options for us in future LEPs.

So there is a fair amount of cost buy-down implicit by going through the very admittedly thorough and therefore costs associated with qualifying these components now in the 61, but we expect to reap benefit from that on future extension programs, life extension programs.

Dr. FLEMING. Okay. Thank you.

And, finally, how would this affect the follow-on cruise missile, long-range standoff missile that will replace the air-launched cruise missile?

Dr. COOK. I will provide a technical answer. As we are looking at options for the long-range standoff, as Dr. Hommert has just said, we have found that we would be able to apply considerable reuse of the nonrecurring engineering expense; in other words, they would be less expensive. So the things like arming and firing the safety switches that Dr. Hommert addressed, in the terms of the nonnuclear elements, a great deal of leverage is applied.

Dr. FLEMING. Right. Yes, go ahead, General.

General KEHLER. Sir, I would just add that today in the strategic force, we have two gravity weapons, the B61 and the B83, as Mr. Garamendi mentioned. We want to eliminate the B83. And we also have a cruise missile today. Our view is that for the future we would like to keep that mixture, a gravity weapon and a cruise missile, because of the military capabilities that they give us, and because of the problems that would present to any adversary.

Dr. FLEMING. Great. Thank you so much, and I yield back.

Mr. ROGERS. Thank the gentleman.

The gentleman from Georgia, Mr. Johnson, is recognized for 5 minutes.

Mr. JOHNSON. Thank you, Mr. Chairman.

Dr. Cook, the fiscal year 2014 Stockpile Stewardship and Management Plan confidently proclaims that the 3+2 strategy is an executable plan; however, the report also notes that many of the plan's proposed life extension programs are in the early study phase, and the cost estimates are not complete. It also notes that

NNSA is unlikely to be able to complete the scope of work it planned to complete in fiscal year 2013 due to budget reductions, to say nothing about future years.

Given these and other caveats presented in the report, how can NNSA proclaim that 3+2 vision achievable?

Dr. COOK. Thank you for the question. I will be direct in the answer.

I have already mentioned the applicability of the B61 component development and how that will carry across to the long-range standoff missile. There is similar applicability to the first interoperable of three that are in the 3+2 strategy. Decisions have been made and endorsed by the Nuclear Weapon Council with regard to improvements in safety and security, and we are on a path of technology development and component maturation. So the fact that we developed confidence in the development and can actually have metrics that tell us where we are, that is where part of the confidence comes from.

I will also say, however, 2013, fiscal year 2013, is over. We are into fiscal year 2014. It would be wonderful to have a budget, it would be wonderful not to have sequestration, but we are where we are.

Mr. JOHNSON. Well, let me ask this question, Dr. Cook: What is the impact on other LEPs if the B61 schedule slips?

Dr. COOK. The short answer is if the 61 slipped, and the other LEPs did not slip, then the—more of the early development costs would be borne by the other LEPs, and so their cost would increase.

Mr. JOHNSON. General Kehler and Ms. Creedon, are you concerned about potential schedule slips?

Secretary CREEDON. Absolutely. And as we have covered, the greatest risk to the B61–12 and, frankly, to the entire 3+2 strategy at the moment doesn't appear to be technical risk, it really is budgetary risk. And it is the ongoing implications of sequestration.

Mr. JOHNSON. General Kehler.

General KEHLER. Sir, I agree with that. Yes.

Mr. JOHNSON. All right. Dr. Cook, how does NNSA plan to manage four to five concurrent LEPs without cost increase and schedule delays?

Dr. COOK. I could give you many details, but I don't have the time. So first I will say these LEPs are in different stages, ranging from stable production where we are with the life-extended ballistic system for the Navy, 76–1, to very early considerations where we are with the long-range standoff option. The B61 is in between: at engineering development. So being very clear about the interdependencies is the first point.

Secondly, we are applying the rigor of earned-value management systems across the board. We are using industry-standard tools, like Primavera, and we are basically providing resource-loaded schedules that give us the confidence that we can execute these in detail.

Mr. JOHNSON. All right. Dr. Cook, one last question. The currently proposed B61 LEP appears to be premised on a number of assumptions that may be outdated. For example, the program seems to assume that the United States would continue to forward-

deploy tactical versions of the B61 in Europe, even though President Obama has stated his desire to negotiate with Russia to remove these weapons. In addition, the new high-level nuclear weapons policy guidance signed by President Obama in June could reduce the number of strategic gravity bombs that are required for deterrence.

How might changes to the existing deterrence requirements alter the currently proposed scope of the B61 LEP?

Secretary CREEDON. Sorry, sir. Since that is more of a policy question than a technical question, if you don't mind.

Mr. JOHNSON. All right.

Secretary CREEDON. So at the moment the President has been very clear that he would like to entertain conversations with Russia and with NATO allies to look at possible reductions. In the meantime, however, the B61 is, in fact, forward-deployed at NATO, and our NATO allies, as I mentioned earlier, have reaffirmed the need for that.

But it is not just the ability to forward-deploy in Europe. I mean, when we look at the 61, it is the total package. It is the strategic as well as the ability to move forward not only in Europe, but also in the Asia-Pacific region should we need it.

Mr. ROGERS. Gentleman's time has expired.

Chair now recognizes the gentleman from Florida, Mr. Nugent, for 5 minutes.

Mr. NUGENT. Thank you, Mr. Chairman. And I appreciate this panel's candor in regards to where we stand on the LEP as relates to B61.

I do want to make a comment. I know where my good friend Mr. Garamendi was coming from, I think I do at least, trying to say, hey, listen, if we have something that works, why are we repairing something that needs to be repaired today?

Mr. GARAMENDI. Very conservative thought.

Mr. NUGENT. Conservative thought. I appreciate that from the gentleman on the left there. But I also—it is not impossible.

But I also have heard you loud and clear, particularly as it relates to the B61 and the flexibility that that gives you versus the 83, and particularly in regards to launch platform, and, secondly, the yield that it would do or collateral damage that it would do.

So I want to make sure that I am clear, particularly from the forward-deployed standpoint. That is part of our posture, is it not, in how we are dealing with possible belligerent countries? Is that important to you?

Secretary CREEDON. That is correct.

Mr. NUGENT. And I would suggest that, you know, we talk about Europe, but we also have an issue as relates to North Korea that is threatening one of our allies in South Korea. So I think you have all answered this very clearly is that you feel that it is imperative that we follow the strategic advice of the experts in this particular issue, Dr. Cook and Dr. Hommert, in regards to moving forward with the transition of the B61; is that correct?

Dr. HOMMERT. Yes. Absolutely.

Dr. COOK. Yes.

Mr. NUGENT. And what is the negative consequence if we don't? What position does that put us in?

Dr. HOMMERT. Well, if we don't execute the life extension program, then we will observe the gradual decay of reliability of this weapon over the next decade, and it will reach a point somewhere, in my view, technical judgment, in the next decade in which it will simply not have the sufficient reliability to do something that General Kehler could have confidence as part of his force.

Dr. COOK. I am going to give the other perspective. If we do not do the 61–12 LEP, we will not be able to retire the B83, the last of the megaton-class weapons. We will not be able to reduce the number of nuclear weapons by a factor of two, nor will we be able to reduce both the amount of special nuclear material in air-delivered bombs because of the number of reductions in numbers and the B83, and—or the destructive power by 80 percent. Those are the nonproliferation, arms control, and very important aspects of conducting the 61 LEP. None of those would be achieved if we don't do the 61–12.

General KEHLER. Sir, investing in the B61 sustains a military capability for us that will go away if we do not.

Secretary CREEDON. And investing in the B61 also provides the extended deterrence to our allies around the world. And in the absence of that reliable extended deterrence, there is a real concern that some of those allies who have the ability to develop their own nuclear weapons would, in fact, do so.

Mr. NUGENT. I appreciate all of your comments, and I will yield back my time.

Mr. ROGERS. Thank the gentleman.

The chair recognizes the gentleman, Mr. Bridenstine, for 5 minutes.

Mr. BRIDENSTINE. Thank you, Mr. Chairman. I will be quick; I know we are voting right now.

Just one quick question for you, General. You talked about the credibility of our weapons being necessary for the credibility of the deterrence. And, of course, we are reducing our—the number of our weapons, and we are reducing our hedge. Do you see any value in proving the credibility of our weapons by maybe doing an underground test of one?

General KEHLER. Sir, not at this time. We consult with the experts, and we are asked annually to assess for the President whether we think that it is necessary to conduct a nuclear explosive test. They do extensive testing on these weapons, not to include nuclear explosive testing. And at this point in time I don't think we gain something that I believe is militarily necessary by doing a nuclear explosive test.

Mr. BRIDENSTINE. So you are comfortable, given the data you are provided, that the hedge is sufficient and our bombs will work?

General KEHLER. Yes, sir. I am very confident of that.

Mr. BRIDENSTINE. Okay. Thank you. That is all I wanted to know. Thanks.

Mr. ROGERS. Mr. Garamendi.

Mr. GARAMENDI. Dr. Cook, you made a statement, your last statement, and you laid out the nonproliferation scenarios. We don't have time now because we are going to go to vote. I would appreciate a detailed explanation of each one of the issues you raised.

Dr. COOK. I would be happy to provide that. It is also in my written testimony and backed up by a number of classified briefings we have done.

Mr. GARAMENDI. Then let us do both.

[The information referred to can be found in the Appendix on page 113.]

Mr. ROGERS. I thank the gentleman.

Before I go to my colleague from Arizona, General Kehler, do you believe the B61 nuclear bombs serve a military purpose in Europe?

General KEHLER. I do. Nuclear deterrence is a military mission, and we—what we would offer is options that—military options in extreme circumstances that that would be available for the President. I believe all of that is a military mission.

Mr. ROGERS. Great. Thank you.

I recognize my friend and colleague from Arizona, Mr. Franks, for 5 minutes.

Mr. FRANKS. Thank you, Mr. Chairman. And thank all of you.

General Kehler, I also want to single you out. I consider you a friend and consider you a friend to human freedom. And I would suggest to you that, as I often have, that my 5-year-old twins have a better chance to walk in the light of liberty someday because men like you lived and wore those stars. And I really appreciate you very, very much.

And with that, I am going to move on to somebody else and ask a question here.

Dr. Cook, how much has been spent to date on the B61 LEP?

Dr. COOK. Just a bit over $1.2 billion.

Mr. FRANKS. And how much of that work that has been done to date would be scrapped in the event that we de-scoped options pursued for the B61?

Dr. COOK. Most of it, but not all of it.

Mr. FRANKS. And now that we are already in engineering development, component qualification, the LEP, would it be easy to descope the program?

Dr. COOK. No, it would not. If we did so, it would set us back about 2 years, and any of the path options that we have identified would be more expensive than continuing with the 61–12.

Mr. FRANKS. So it wouldn't save us any money.

Dr. COOK. It would not.

Mr. FRANKS. Do any of the witnesses think it makes any sense to reduce the scope of this LEP?

Secretary CREEDON. No.

Dr. HOMMERT. No.

General KEHLER. No.

Mr. FRANKS. Mr. Chairman, I have other questions, but I am going to stop right there and thank the panel and thank the chairman for the time.

Mr. ROGERS. Thank you very much. Thank all of you very much. It has been very helpful. You did a great job. And we are now adjourned.

[Whereupon, at 4:49 p.m., the subcommittee was adjourned.]

A P P E N D I X

OCTOBER 29, 2013

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

OCTOBER 29, 2013

Opening Remarks – As Prepared for Delivery

The Honorable Mike Rogers
Chairman, Subcommittee on Strategic Forces
House Armed Services Committee

Hearing on "Nuclear Weapons Modernization Programs: Military, Technical, and Political Requirements for the B61 Life Extension Program and Future Stockpile Strategy"

October 29, 2013

Good afternoon. The subcommittee will come to order.

Welcome to the Strategic Forces Subcommittee hearing on Nuclear Weapons Modernization Programs. This subcommittee has been tracking these programs very closely, and this hearing is about digging into one in particular: the B61 Life Extension Program (LEP).

Our distinguished witnesses all play important roles in the B61 LEP from a variety of angles. The witnesses comprise the key leaders responsible for policy, military and operational requirements, program oversight, and technical and program execution on the LEP. They will help us understand the details of the program, the requirements that are driving it, its history and current status, and its outlook for the future.

Our witnesses include:

- **The Honorable Madelyn Creedon**
  Assistant Secretary of Defense for Global Strategic Affairs
  U.S. Department of Defense

- **General C. Robert Kehler**
  Commander
  U.S. Strategic Command

- **Dr. Donald Cook**
  Deputy Administrator for Defense Programs
  National Nuclear Security Administration

- **Dr. Paul Hommert**
  President and Laboratories Director
  Sandia National Laboratories

I appreciate you taking the time to prepare for this hearing, and we always appreciate the contributions you each make to your country.

I'm going to keep my statement very brief, so that we have the maximum time possible for questions and answers. But I do want to take a moment to highlight one issue—the misperceptions and misinformation we see in the public discourse on the B61 LEP. We've seen massively uninformed editorials and articles out there on the B61:

- Arguments that NATO should pay for the LEP—despite this being a U.S. nuclear weapon that we need for our own strategic deterrent.

- Arguments that the B61 doesn't need to be rebuilt now—despite clear testimony to the contrary from our lab directors and military commanders (including General Kehler and Dr. Hommert).

- Arguments that there is a reduced-scope option for the LEP that would cost less and still meet requirements—despite numerous statements and documents from the Administration showing the exact opposite is true.

The list goes on and on and I plan to get into this during the questioning period. We will engage in a bit of myth-busting today—and lay out the clear, undeniable facts about this critical program.

For now, I'd like to introduce for the record a series of documents provided to the committee by DOD and DOE that clearly shows reality (without objection, so ordered). It is time to leave aside the misinformation and fantasy that has seeped into the public debate and deal with the real world.

Along those same lines, I offer the reality of military perspective—I'd like to introduce for the record this letter we received from four former commanders of U.S. Strategic Command and its predecessor command (without objection, so ordered). These four retired senior officers eloquently summarize why cuts to the B61 LEP—as recommended by only one of the four congressional committees—would not only harm the U.S. deterrent, but also have major negative impacts on our allies and our nonproliferation goals.

Thank you again to our witnesses—I look forward to the discussion.

With that, let me turn to our ranking member for any statement he would like to make.

**Statement of Congressman Jim Cooper, Ranking Member,
Subcommittee on Strategic Forces**

Hearing: Nuclear Weapons Modernization Programs: Military, Technical, and Political Requirements for the B61 Life Extension Program and Future Stockpile Strategy

October 29, 2013

President Obama in the Nuclear Posture Review laid out a strategy for maintaining a safe, secure and reliable arsenal while pursuing further nuclear weapons reductions and strengthening nonproliferation. In this context, we must understand what investments are necessary to carry out an effective strategy and maintain a credible nuclear deterrent to meet post-Cold War threats in an era of constrained budgets.

First, with regard to the B61 specifically, there are concerns about the cost and complexity of the currently planned B61 life extension program (LEP) and whether they are necessary for extended deterrence in the longer-term. The Administration is embarking on a $10-12 billion program -- the most expensive life extension ever undertaken. This cost includes the warhead life extension program done by the National Nuclear Security Administration (NNSA) estimated to cost between $8.1 and 10.1 billion according to NNSA and the Department of Defense's Cost Assessment and Program Evaluation office (CAPE), added to the $1.6 billion required for a new tail-kit provided by the Air Force -- bringing the total life extension cost to $10-12 billion.

We must better understand why a less expensive alternative (notably the "1E" LEP option) is not being pursued, how long we plan to keep B61s deployed, what constitutes credible political reassurance for our allies, and what reductions in the number of nuclear weapons are planned, and what safety risks are associated with forward-deployed B61. Former Senator Sam Nunn recently wrote that "Today, tactical nuclear weapons in the Euro-Atlantic region are more of a security risk than asset to NATO".

Second, more generally, we cannot consider the B61 in a vacuum. What must be prioritized and how do we plan for affordable, yet strong and effective nuclear deterrent?

The NNSA plans to conduct four to five concurrent LEPs for the next 25 years. These other planned modernization programs are extremely ambitious, increasing the risk of delays and cost increases for deliverables for the Department of Defense. These programs include a replacement for the arming, fuzing and firing system for the W88, a *new* nuclear cruise missile and *three new* interoperable warhead LEPs, in addition to sustaining the W61, W78, W80, B83, B87, W88 stockpile.

I have serious reservations that NNSA can realistically manage and that we can afford this expensive modernization plan. Preliminary cost estimates for the each of the new programs range between at least $12 billion and 15 billion and counting. What must be prioritized and how do we plan for affordable, yet strong and effective nuclear deterrent?

Again, can we afford this? I fear the answer is probably no. I say that because, with just the ongoing W76 and B61 on NNSA's plate, the cost and management problems in the last two years have been abysmal.

As evidence I cite a few examples:

- 5-year deferral of the Plutonium Chemistry Facility due, in part, to billion dollar cost growth
- Cancellation of the plutonium disposition facility at Savannah Rover Site due, in part, to a billion dollar cost growth
- Cost growth from $1 billion to over $7.7 billion for the MOX facility at Savannah River Site
- Cost growth by $1.5 billion for the W76 warhead program on a base of $4.3 billion
- Cost growth by $3-5 billion for the B61 warhead life extension program on a base of $5.3 billion
- Cost growth for the uranium facility at Y-12 of several billion on a base of $5 billion with a need to redesign the facility

- An 83-year old nun breaks into the perimeter of what should be one of the most secure facilities in the world

And third, I look forward to discussing how further nuclear weapons reductions fit in the plan. When will the promised reductions associated with the B61 LEP and the interoperable warheads occur, and will they be permanent reductions that will increase strategic stability? And what is the plan to gain consent in the Senate to ratification of the Comprehensive Test Ban Treaty?

Thank you to the witnesses for being here today and thank you Mr. Chairman.

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THE HOUSE ARMED SERVICES COMMITTEE

STATEMENT OF

THE HONORABLE MADELYN R. CREEDON
ASSISTANT SECRETARY OF DEFENSE
GLOBAL STRATEGIC AFFAIRS

BEFORE THE HOUSE
ARMED SERVICES
STRATEGIC FORCES SUBCOMMITTEE

OCTOBER 29, 2013

NOT FOR DISTRIBUTION UNTIL RELEASED BY
THE HOUSE ARMED SERVICES COMMITTEE

The Administration has consistently expressed its support for a full-scope Life Extension Program (LEP) for the B61 nuclear gravity bomb as part of its long-term strategy for a safe, secure, and effective nuclear deterrent for the United States and its Allies and partners. This past June, the President signed new nuclear employment guidance that re-emphasized the U.S. commitment to the nuclear Triad and introduced a new approach to hedging with a more reliable, but reduced stockpile. The new hedging guidance informs the long-term strategic plan developed by DoD and the NNSA to sustain the stockpile and revitalize the supporting infrastructure in the most efficient manner possible. The baseline modernization strategy, also known as the "3+2" strategy, would consolidate the twelve unique warhead types used today into three interoperable warhead designs that function with both submarine and land-based missiles and an additional two aircraft delivered weapons. This consolidation, modernization, and reduction in warhead types would set the stage for a reduction in the total numbers of weapons in the stockpile and increased confidence in newly refurbished weapons.

The B61 is the oldest warhead design in the U.S. nuclear stockpile, with several components dating from the 1960s. Its modernization is the first full-scope LEP the nuclear enterprise has undertaken since new warhead production was suspended in the 1990s. The B61-12 LEP will address multiple components, nuclear and non-nuclear, that are currently hampered by aging issues; it will meet military requirements and guarantee an extended service life coupled with more affordable sustainment costs; and it will incorporate the upgrades that NNSA deems mandatory to provide a nuclear stockpile that is safe, secure, and effective. A successful B61-12 LEP facilitates consolidation of four of the currently deployed non-strategic and strategic B61-weapon types into one variant and allows for the eventual retirement of two other strategic air-delivered weapons, the B61-11 and the B83 nuclear gravity bombs. We believe it should

reduce stockpile sustainment costs and the strain on surveillance resources, and ultimately it will be the only nuclear gravity bomb available for use in the air leg of the nuclear Triad.

A key component of the B61-12 LEP is the newly designed guided Tail Kit Assembly. It allows the obsolete and prohibitively expensive parachute system to be replaced, and will result in a more accurate system. The improved accuracy will allow the B61-12 to achieve the same military effects of today's highest-yield versions, while incorporating the smallest yield design available. By balancing lower yield with increased accuracy we are maintaining current military capability of today's B-61, with lower yield and less nuclear materials. The improved guidance contributes to overall weapon readiness, which in turn will allow the number of B61 weapons that we maintain in the inventory to be reduced without negatively affecting capabilities. Finally, the new tail kit is vital to the successful integration of the B61-12 with the F-35 Joint Strike Fighter aircraft. . This feature is doubly important because the F-35 is destined to become the only dual-capable fighter aircraft in U.S. and many Allied air forces. I must emphasize that without a fully funded and successful U. S. Air Force acquisition of the guided tail kit, the B61-12 will not meet the military requirements that Commander, U.S. Strategic Command (CDR USSTRATCOM) has identified.

The Selected Acquisition Reports (SARs) for NNSA provide a total estimated cost of approximately $8.1 billion through 2024. With the Office of the Secretary of Defense, Cost Assessment and Program Evaluation (CAPE) in the lead, several offices within the DoD are working diligently with NNSA to improve management and generate operating efficiencies in order to deliver the B61-12 on schedule and budget. However, the impacts of sequestration threaten to undermine these efforts and contribute to further unplanned cost growth by extending the development and production periods. In Fiscal Year (FY)2013 sequestration reduced

NNSA's total resources by 7.8 percent and stressed the nuclear enterprise's ability to support the long-term aspects of the "3+2" modernization strategy in order to try to protect its near-term efforts like the B61-12 LEP. Sequestration has already resulted in a roughly six-month delay to the first production unit of the B61-12 from late 2019 to early 2020. Without a solution to the current fiscal crisis in FY2014, the DoD and DoE will be forced to make even more difficult decisions that could reduce the long term financial benefits of the "3+2" strategy. Despite these challenges, the Administration remains committed to completing a full-scope B61-12 LEP and the long-term fiscal and national security benefits that the "3+2" strategy presents.

There are some who believe that there is a less expensive alternative to the B61-12 that was never considered, but I can assure you that each and every modernization design proposal available was presented to the Nuclear Weapons Council (NWC) during its decision process. Only after rigorous and thorough evaluation of each possibility did the Council unanimously conclude that the B61-12 full-scope LEP was the least expensive long-term option that could meet military requirements. The less expensive alternative, also known as the "Triple Alt," would severely restrict the modernization to just a few select non-nuclear components, and would cost more than the just one fourth of the B61-12 LEP, as some advocates claim. The triple-alt option, considered and rejected as part of the B61-12 selection process, does not meet military requirements. Over the long term, it would actually increase the overall cost of maintaining the B61 and the inventory of gravity weapons by requiring up to two additional LEPs for the B61. It would also prevent the planned consolidation or retirement of several hundred weapons previously mentioned, including the B83, the last megaton weapon in the U.S. stockpile. Given the additional LEP requirements, inefficient sustainment costs, and the sunk

costs already applied to the B61-12 program, the Triple Alt would actually be the more expensive program overall and not meet military requirements.

The role of nuclear weapons in NATO was examined just last year in NATO's Deterrence and Defense Posture Review (DDPR) and was not changed by the newly issued nuclear employment guidance. The DDPR confirmed that nuclear weapons are a "core component" of NATO's defense; that the supreme guarantee of Allies' security is provided by the strategic nuclear forces of the Alliance, particularly those of the United States; and that "NATO will remain a nuclear alliance" as long as nuclear weapons exist. The DDPR also sets the goal of "creating the conditions for a world without nuclear weapons," which is consistent with the U.S. goal. Moreover any changes in NATO's nuclear posture must be decided jointly by the Alliance.

The President reaffirmed this commitment in his June 2013 Berlin speech and announced his intent to work closely with Allies to seek bold reductions with Russia in non-strategic nuclear weapons in Europe. He also reiterated our commitment in the 2010 Nuclear Posture Review to maintain the capability to forward-deploy nuclear weapons with heavy bombers and dual-capable aircraft. Make no mistake, even if the NATO Alliance struck an agreement with Russia to mutually reduce tactical nuclear weapons, we would still need to complete the B61-12 LEP on the current timeline.

The commitment we make to refurbish this nuclear weapon system will serve as a concrete signal to the world of our commitment to the nation's security, and our position as a guarantor of nuclear deterrence and assurance to our Allies and partners.

The B61-12 LEP is an important component of our commitment to the revitalization of the nation's nuclear deterrent; it is the first of several refurbishment programs that make up our

long-term "3+2"modernization and management strategy; and its role in providing nuclear deterrence throughout the globe is extremely important. The DoD and NNSA will continue to work together to manage costs and maximize available efficiency measures and practices, while working to offset the negative effects of sequestration. The Administration is committed to making the necessary investments in our nuclear deterrent and the "3+2" modernization strategy, and the B61-12 LEP is the first tangible demonstration supporting this strategy. The value and importance of its success cannot be overstated.

Madelyn R. Creedon

Assistant Secretary for Global Strategic Affairs (GSA)

Madelyn Creedon was confirmed by the U.S. Senate as the Assistant Secretary of Defense for Global Strategic Affairs (GSA) on August 2, 2011. In this capacity she supports the Under Secretary of Defense for Policy in overseeing policy development and execution in the areas of countering Weapons of Mass Destruction (WMD), U.S. nuclear forces and missile defense, and DOD cyber security and space issues.

Prior to her confirmation, Ms. Creedon was counsel for the Democratic staff on the Senate Committee on Armed Services and was responsible for the Subcommittee on Strategic Forces as well as threat reduction and nuclear nonproliferation issues.

In 2000, she left the Armed Services Committee to become the Deputy Administrator for Defense Programs at the National Nuclear Security Administration, Department of Energy (DOE), and returned to the Committee in January 2001.

Prior to joining the Armed Services Committee staff in March 1997, she was the Associate Deputy Secretary of Energy for National Security Programs at the Department of Energy, beginning in October 1995.

From November 1994 through October 1995, Ms. Creedon was the General Counsel for the Defense Base Closure and Realignment Commission. This Commission, under the Chairmanship of former Senator Alan Dixon of Illinois, was responsible for recommending to the President military bases for closure or realignment.

From 1990 through November 1994, Ms. Creedon was counsel for the Senate Committee on Armed Services, under the Chairmanship of Senator Sam Nunn. While on the committee staff she was responsible for DOE national security programs, DOE and DOD environmental programs, and base closure transition and implementation programs.

Before joining the staff of the Senate Armed Services committee, Ms. Creedon was a trial attorney and Acting Assistant General Counsel for special litigation with the DOE Office of the General Counsel for 10 years.

Born and raised in Indianapolis, Indiana, Ms. Creedon is a graduate of St. Louis University School of Law, where she was captain of the moot court team. Her undergraduate degree is in political science from the University of Evansville, Evansville, Indiana.

HOUSE COMMITTEE ON ARMED SERVICES

SUBCOMMITTEE ON STRATEGIC FORCES

STATEMENT OF

GENERAL C. R. KEHLER

COMMANDER

UNITED STATES STRATEGIC COMMAND

BEFORE THE

HOUSE COMMITTEE ON ARMED SERVICES

SUBCOMMITTEE ON STRATEGIC FORCES

29 OCTOBER 2013

Good afternoon. Chairman Rogers, Ranking Member Cooper, and distinguished members of the subcommittee. I am pleased to be here today with my esteemed colleagues to discuss the B61 Life Extension Program (LEP) and how it fits within our broader stockpile strategy.

Mr. Chairman, our nation's nuclear forces perform three key functions: deterring potential adversaries via credible nuclear capabilities and effective plans; assuring allies and partners of our extended deterrence commitments to them; and, in the unlikely event deterrence fails, employing nuclear weapons when directed by the President to achieve U.S. and Allied objectives. To accomplish these functions the nation requires a sound strategy, flexible guidance, effective plans, well-trained people, modernized nuclear delivery systems and associated life extension programs for the warheads, assured command and control, and the highly specialized infrastructure necessary to sustain them.

Today we are at the front end of a multi-decade effort to recapitalize our nuclear deterrent force and its supporting infrastructure. Planned investments will allow us to sustain the nuclear Triad of delivery vehicles, enable critical improvements to our national command and control systems, and systematically extend the life of essential weapons in the stockpile. We are studying options to recapitalize the responsive land-based ballistic missile capability while sustaining our current Minuteman III force through 2030. We are developing a modern long-range penetrating bomber and replacement cruise missile while upgrading our B-52H and B-2A bomber force to maintain today's visible and flexible air capability. We are proceeding with the Ohio-class Replacement Program to maintain an assured and survivable at-sea capability. We are selectively modernizing the nuclear command, control and communication (NC3) architecture to ensure secure, survivable, and enduring communications between the President

and the nuclear forces. In the meantime, investment in our space-based assured communications and strategic warning systems will address existing capability gaps as we sustain the current NC3 systems in the near-term.

In the context of this larger investment picture, I'd like to focus this afternoon on the nuclear weapon stockpile and in particular the B61 gravity bomb.

The Nuclear Weapons Council recently approved a policy-based, long-term strategy and initial implementation plan to sustain the stockpile and modernize our nuclear complex. This 3+2 strategy—so named because it will ultimately result in three ballistic missile warheads and two air-delivered warheads—allows us to build a modern stockpile to address 21st century threats and uncertainty. Through a series of synchronized life extension programs like the B61-12, we plan to improve confidence in the reliability, safety and intrinsic security of our nuclear weapons. Along the way, these programs will keep meaningful work in the nuclear complex and provide the impetus to develop and retain the critical workforce skills the United States needs to sustain the deterrent force.

Today's B61 inventory consists of five distinct variants all requiring unique and complex logistical support. The average B61 is over 25 years old, contains antiquated technology, and requires frequent handling for maintenance. Only through extraordinary measures has this aging family of weapons remained safe, secure and effective far beyond its originally planned operational life. As envisioned, the B61-12 LEP will extend that safety, security and effectiveness for decades. Specifically, the program addresses known aging issues, updates technology to meet 21st century operational and security standards, reduces maintenance intervals, and consolidates multiple variants into a single design. This consolidation offers opportunities for cost savings and significant stockpile reductions while maintaining U.S.

national security objectives and extended deterrence commitments. Finally, the B61 LEP has been optimized in both scope and timing to match the limited throughput of the nuclear industrial complex.

From my military perspective, the B61 is a key component of the 3+2 strategy and represents a necessary capability to meet national guidance. First, our recently updated nuclear employment guidance directs us to retain a Triad of nuclear delivery vehicles—a construct that gives our deterrent force strength, resilience and flexibility. The current and future nuclear bomber force is a necessary and crucial component of the Triad and arming that force is a top priority. Second, the life-extended B61-12 is envisioned to be the only nuclear gravity weapon in the future arsenal, enabling significant reductions in the overall stockpile and avoiding the enormous costs of successive, sequential life extensions to multiple families of systems. Third, the work being done on the B61 can be leveraged for future life extension programs. Failure to conduct this life extension now will discard that leverage and increase costs of future life extension programs. Finally, the B61 is the only weapon in the stockpile that fulfills both tactical and strategic missions.

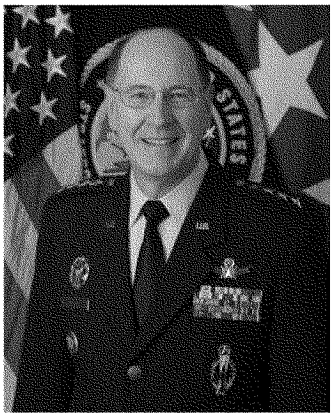
While the current force is safe, secure and effective, I remain concerned that the substantial modernization efforts I've described come in the midst of a difficult financial period. In my view, the need for wise and sustained investments increases as we decrease the number of deployed weapons to New START levels. As we face budgetary constraints, we should not abandon the tenets of our strategy. Instead, we must continually assess options to re-phase programs while meeting our security objectives and strategic mission requirements, and preserve program flexibility in case a planned course of action proves infeasible.

I give my strongest endorsement to the 3+2 strategy and to the B61-12 LEP. Over the long term, it is the right course of action to cost-effectively extend the life of our weapons, modernize our infrastructure and preserve our deterrent capability. I look forward to working with this subcommittee to ensure that the critically important modernization and sustainment programs for the platforms, weapons, command and control, and infrastructure proceeds as needed; and I look forward to your questions.

BIOGRAPHY

UNITED STATES AIR FORCE

GENERAL C. ROBERT "BOB" KEHLER



Gen. C. Robert "Bob" Kehler is the Commander, U.S. Strategic Command, Offutt Air Force Base, Neb. He provides the President and Secretary of Defense with a broad range of strategic capabilities and options for the joint warfighter through several diverse mission areas, including combating weapons of mass destruction, integrated missile defense, ISR, and global strike. He is responsible for the plans and operations for all U.S. forces conducting strategic deterrence and DoD space and cyberspace operations. He has commanded at the squadron, group, wing and major command levels and has a broad range of operational tours in ICBM, space launch, space control, space and missile warning operations.

General Kehler entered the Air Force in 1975 as a distinguished graduate of the Pennsylvania State University Air Force R.O.T.C. program. He commanded a Minuteman ICBM operations squadron at Whiteman AFB, Mo., the Air Force's largest ICBM operations group at Malmstrom AFB, Mont., the 30th Space Wing at Vandenberg AFB, Calif., the 21st Space Wing at Peterson AFB, Colo., Air Force Space Command, and America's ICBM force before its transition from Air Force Space Command to Air Force Global Strike Command in December 2009.

General Kehler's staff assignments include tours with the Air Staff, Strategic Air Command headquarters and Air Force Space Command. He was also assigned to the Secretary of the Air Force's Office of Legislative Liaison, where he was the point man on Capitol Hill for matters regarding the President's ICBM Modernization Program. As Director of the National Security Space Office, General Kehler integrated the activities of a number of space organizations on behalf of the Under Secretary of the Air Force and Director, National Reconnaissance Office. He has also served as Deputy Director of Operations, Air Force Space Command, and as Deputy Commander, U.S. Strategic Command.

EDUCATION

1974 Bachelor of Science degree in education, Pennsylvania State University, State College
1980 Distinguished graduate, Squadron Officer School, Maxwell AFB, Ala.
1982 Air Command and Staff College, by correspondence
1987 Master of Science degree in public administration, University of Oklahoma, Norman
1988 Armed Forces Staff College, Norfolk, Va.
1992 Air War College, by seminar
1995 Naval War College, Newport, R.I.
1995 Master of Arts degree in national security and strategic studies, Naval War College, Newport, R.I.
1998 Program for Executives, Carnegie-Mellon University, Pittsburgh, Pa.

2002 National Security Leadership Course, Maxwell School of Citizenship and Public Affairs, Syracuse University, N.Y.
2006 Program for Senior Executives in National and International Security, John F. Kennedy School of Government, Harvard University, Cambridge, Mass.

ASSIGNMENTS

1. April 1975 - June 1975, student, missile combat crew operational readiness training, Vandenberg AFB, Calif.
2. June 1975 - January 1981, missile combat crew member, instructor, senior evaluator, and Emergency War Order instructor, 341st Strategic Missile Wing, Malmstrom AFB, Mont.
3. January 1981 - April 1982, personnel staff officer, Air Staff Training Program, Headquarters U.S. Air Force, Washington, D.C.
4. April 1982 - January 1985, missile operations staff officer, Headquarters Strategic Air Command, Offutt AFB, Neb.
5. January 1985 - January 1988, resource planner, Directorate of Air Force Operations Plans, and Chief, Strategic Missile Branch, Secretary of the Air Force Office of Legislative Liaison, Headquarters U.S. Air Force, Washington, D.C.
6. January 1988 - June 1988, student, Armed Forces Staff College, Norfolk, Va.
7. July 1988 - July 1991, nuclear employment and policy planner, Nuclear and Chemical Division, Joint Staff, the Pentagon, Washington, D.C.
8. July 1991 - July 1992, Commander, 508th Missile Squadron, Whiteman AFB, Mo.
9. July 1992 - February 1993, Deputy Commander, 351st Operations Group, Whiteman AFB, Mo.
10. February 1993 - August 1994, Commander, 341st Operations Group, Malmstrom AFB, Mont.
11. August 1994 - July 1995, student, Naval War College Newport, R.I.
12. July 1995 - August 1995, Inspector General, Headquarters Air Force Space Command, Peterson AFB, Colo.
13. August 1995 - June 1996, Deputy Director of Operations, Headquarters AFSPC, Peterson AFB, Colo.
14. June 1996 - June 1998, Commander, 30th Space Wing, Vandenberg AFB, Calif.
15. June 1998 - September 1999, Chief, Space Superiority Division, and Chairman, Space Superiority and Nuclear Deterrence Panel, Office of the Deputy Chief of Staff for Plans and Programs, Headquarters U.S. Air Force, Washington, D.C.
16. September 1999 - August 2000, special assistant to the Director of Programs, Office of the Deputy Chief of Staff for Plans and Programs, Headquarters U.S. Air Force, Washington, D.C.
17. August 2000 - May 2002, Commander, 21st Space Wing, Peterson AFB, Colo.
18. May 2002 - May 2005, Director, National Security Space Integration, Office of the Under Secretary of the Air Force, Washington, D.C.
19. May 2005 - October 2007, Deputy Commander, U.S. Strategic Command, Offutt AFB, Neb.
20. October 2007 - January 2011, Commander, Air Force Space Command, Peterson AFB, Colo.
21. January 2011 - present, Commander, U.S. Strategic Command, Offutt AFB, Neb.

SUMMARY OF JOINT ASSIGNMENTS

1. July 1988 - July 1991, nuclear employment and policy planner, Nuclear and Chemical Division, Joint Staff, the Pentagon, Washington, D.C., as a major and lieutenant colonel
2. May 2005 - October 2007, Deputy Commander, U.S. Strategic Command, Offutt AFB, Neb., as a lieutenant general

OPERATIONAL INFORMATION

Weapon systems: Minuteman II and Minuteman III, Defense Support Program
Launch systems: Titan II, Titan IV and Delta II

MAJOR AWARDS AND DECORATIONS

Distinguished Service Medal with oak leaf cluster
Defense Superior Service Medal
Legion of Merit with two oak leaf clusters
Defense Meritorious Service Medal
Meritorious Service Medal with three oak leaf clusters
Air Force Commendation Medal

INTERNATIONAL AWARDS AND DECORATIONS
French Legion of Honor (Officer)

PUBLICATIONS
"Nuclear Armed Adversaries and the Joint Commander," Naval War College Review, Winter 1996

EFFECTIVE DATES OF PROMOTION
Second Lieutenant April 10,1975
First Lieutenant April 10,1977
Captain April 10,1979
Major May 1, 1985
Lieutenant Colonel June 1,1989
Colonel Feb. 1,1994
Brigadier General July 1, 2000
Major General Aug. 1, 2003
Lieutenant General June 1, 2005
General Oct. 12, 2007

(Current as of April 2013)

Statement of Dr. Donald L. Cook
Deputy Administrator for Defense Programs
National Nuclear Security Administration
U.S. Department of Energy
On the
The B61 Life Extension Program and Future Stockpile Strategy
Before the
Subcommittee on Strategic Forces
House Committee on Armed Services

INTRODUCTION

Chairman Rogers, Ranking Member Cooper, and distinguished members of the Subcommittee, thank you for having me here to discuss the President's plans for nuclear weapon modernization focused on the B61 Life Extension Program (LEP) and the Nuclear Weapons Council (NWC) approved "3+2 Strategy." Your ongoing support for the men and women of the National Nuclear Security Administration (NNSA) the work they do, and your bi-partisan leadership on some of the most challenging national security issues of our time, has helped keep the American people safe, assured our allies, and enhanced global security.

I am here to state how critically important it is for the United States to have an unambiguous and effective strategy to achieve the goals articulated very clearly by the President, first at Prague in 2009, again in the 2010 Nuclear Posture Review, and most recently in Berlin this June to ensure a safe, secure and effective deterrent while reducing the number and types of nuclear weapons. That national strategy is the "3+2" Strategy advocated by the U.S. Strategic Command, endorsed by the NWC, and with congressional support, will be implemented by the NNSA and the DoD Services.

I will also take a moment to discuss an integral part of the "3+2 Strategy", the B61-12 LEP, and why your continued support is essential to achieve a significant reduction in our stockpile of nuclear bombs while meeting the President's commitment to maintain a safe, secure, and effective arsenal to deter any adversary, and guarantee that defense to our allies.

3 + 2 Strategy

The B61-12 Life Extension Program created the opportunity to reduce the number of weapon variants and opened the door for further reductions in stockpile numbers. This opportunity forms a key part of the fundamental basis for the "3+2" Strategy. Fewer weapon types provide the President with the flexibility to respond to technical and geopolitical uncertainty and meet the requirement to maintain a safe, secure, and effective arsenal while reducing our reliance on nuclear weapons.

The "3 + 2" Strategy is a significant advancement in the continued evolution away from the Cold War strategy of a large and diverse stockpile and makes marked improvements in the safety and security of the weapons that remain. Our existing stockpile today consists of two submarine launched ballistic missiles (SLBMs), two Intercontinental ballistic missiles (ICBMs), and three air delivered systems with multiple modifications. "3 + 2" is a long-term strategy that will move us toward a stockpile consisting of only three interoperable ballistic missile warheads deployed on both the SLBM and ICBM legs of the Triad and two air delivered warheads deployable on strategic bombers and tactical aircraft. Interoperable means that the nuclear explosive packages can be interchanged between the SLBM and the ICBM.

Already, the United States has reduced the size of our nuclear stockpile very substantially – by more than 80% – since its peak during the Cold War. Today we have the smallest stockpile since the Eisenhower Administration. The interoperability provided by implementing the "3+2" Strategy will allow the United States to reduce further its hedge against technical failure and geopolitical surprise while maintaining an effective deterrent through a balanced and flexible stockpile. The W78/88-1 LEP is the first of three interoperable warheads supporting the "3+2" Strategy that will be addressed as funding becomes available. By deploying a warhead that the DoD can use in either an Air Force Mk21 aeroshell or a Navy Mk5 aeroshell, a single pool of hedge warheads can respond to technical issues or a change in the security posture. Further, the opportunity exists to make a qualitative improvement in the safety of these systems by utilizing insensitive high-explosives with demonstrated effectiveness based on tested designs. Work is currently underway that will culminate in a Weapon Design and Cost Report that will enable a cost-informed decision on the W78/88-1 LEP design and schedule during FY 2015.

B61-12 LEP Planning

The B61 is one of the oldest nuclear weapons in the stockpile and requires refurbishment of some of its components in order to remain viable for years into the future. The B61 has major strategic and tactical requirements, to which the DoD will speak. From the NNSA perspective, we are charged with maintaining the health of the B61 variants currently in the active stockpile and also conducting the life extension program on this important aspect of our nuclear deterrent.

LEP planning is a complex NNSA and DoD process to balance a number of goals, objectives and constraints. The key to this process is preventing any operational gaps in the Nation's nuclear deterrence capabilities while enhancing the safety, security and effectiveness of the stockpile. NNSA manages the LEP planning and execution process by working through the NWC approved "6.X" process covering the life extension of a weapons system from initial feasibility studies through development and production. The scope, schedule and cost for all LEPs is managed

through this 6.X process, and it typically runs over the course of about 10-15 years. The NWC makes decisions at critical junctures along the 6.X process.

On February 27, 2012, the NWC authorized the United States Air Force (USAF) and the NNSA to begin Phase 6.3 Engineering Development for the B61-12 LEP. The B61-12 LEP will consolidate the existing B61 variants, also known as mods 3/4/7/10, into the mod 12, which will provide strategic and extended deterrence for an additional 20 years following the First Production Unit in 2020.

Regarding the NWC process that led to the decision to choose the final scope of the B61-12 LEP, let me be clear that the resulting decision supported the lowest cost option that meets threshold military requirements. For three years, from 2010-2012, the NNSA, in consultation with the NWC , evaluated four major options for the B61 LEP with many sub-options before selecting the current B61-12 design approach. The major options reviewed included the "Triple Alt" (replacing only three end-of-life components), Option 1E (a non-nuclear LEP), Option 3B (nuclear and non-nuclear LEP maximizing reuse of components), and Option 2C (full nuclear and non-nuclear LEP with enhanced surety capabilities). Parametric cost estimates intended only for NWC decision option down-selection--and not to serve as initial cost estimates--ranged from $1.3 billion to $7.9 billion for a 2017 First Production Unit (FPU). A subset of these options also assessed FPU in 2019 to reduce schedule risk. After reviewing those options, the NWC in December 2011 selected the Option 3B as the program that would satisfy the threshold (minimum) requirements at the lowest life cycle cost, over 25 years.

The chosen option - Option 3B - maximizes the reuse of nuclear and non-nuclear components while meeting the needed design life. This option forgoes the newest surety technologies and instead improves security and safety of the bombs using somewhat older, but proven, technologies. Although two of the other options had lower initial costs, their lifecycle costs were higher as a result of not addressing all known aging concerns. Because of this, these two options would necessitate starting another life extension program after initial alterations in order to address the remaining concerns.

Furthermore, Option 3B architecture allows for consolidation of existing B61 variants (B61-3/4/7/10) with the integration of an Air Force provided tailkit assembly. This decision improves the survivability of our pilots, reduces the certification challenge for our laboratories, and eliminates the need for a parachute. As an additional benefit, U.S. Strategic Command determined that with the accuracy provided by a tail kit, the yield provided by today's lowest yield B61 variant would be sufficient to meet all of the strategic and non-strategic requirements for gravity systems. As a result, there will no longer be any need to design, develop, certify, or maintain multiple variations of the B61. The resulting single modification for the B61, the Mod

12, provides a global, responsive, and visible deterrent deployable on strategic bombers and non-strategic aircraft.

LEP Costs

Following the 6.3 decision, NNSA and the U.S. Air Force finalized the requirements for the selected LEP option, and finalized the B61-12 Weapon Design and Cost Report in July 2012. After further work on risk mitigation and schedule integration, the NNSA submitted the initial cost estimate for the B61-12 LEP to Congress in May 2013, with the first formal Selected Acquisition Report (SAR). Other than to account for the added schedule driven by sequestration cuts in FY 2013, that baseline cost estimate has not deviated from the Weapon Design and Cost Report from July 2012.

The current cost estimate reported in the May 2013 Selected Acquisition Report to Congress is $8.1B which includes $7.3B in direct B61-12 funding (including management reserve) and another $0.8B in other NNSA funds. However, FY 2013 sequestration underfunded the program. As a result, NNSA slipped the First Production Unit (FPU) from September 2019 to March 2020 and added $244M to the management reserve to offset the potential increased cost and risks with slipping the program six months. The first B61-12 Selected Acquisition Report to Congress, which formally documents weapon program cost and schedule, included the sequestration impacts. NNSA is submitting quarterly updates to Congress on cost and schedule and will formally update the cost estimate following the Baseline Design Review to establish an Acquisition Program Baseline in FY2016.

The estimate is founded on firm military requirements and a disciplined approach to product realization informed by historical data. This is a significant investment consistent with other major weapon-system acquisitions. To keep the program on schedule and to control cost, NNSA has implemented rigorous systems engineering and program management practices. As required each quarter, NNSA will submit to Congress our continued progress in subsequent Selected Acquisition Reports.

LEP Execution

The B61-12 LEP is making great progress. We are in the second year of full scale engineering development. The program has met its development milestones, it is on schedule and it is on budget. Today, the most significant risk the program faces is not technical risk, but uncertainty of consistent funding. However, because of the demonstrated success we have had to date, confidence from U.S. Strategic Command and the NWC has been sufficient to expand planning for the consolidation of nuclear bombs by including the future retirement of the B83 in the overall strategy. This allows for a reduction in the total (active and inactive) number of U.S. nuclear gravity bombs by a factor of two within a few years after completion of the B61-12 LEP.

The reduction in numbers of bombs and the decision to use the lowest yield variant from today's stockpile can reduce the total amount of special nuclear material in the total (active and inactive) number of U.S. nuclear gravity bombs by more than a factor of six. This equates to a substantial reduction in the total potential nuclear explosive yield within the air-delivered weapons in the U.S. nuclear stockpile. These planned reductions in the number of weapons, explosive yield, and amount of special nuclear material are all dependent upon successful completion of the B61-12 LEP, which in turn directly contributes to the President's goal of reducing the number and types of nuclear weapons, as outlined in his Prague speech in 2009, the 2010 Nuclear Posture Review, and restated in Berlin in the updated nuclear employment guidance from this June.

B61 LEP and the Broader Stockpile Stewardship Program

The B61 LEP represents not only a critical modernization activity to sustain the health of the nuclear deterrent and a viable triad, but from the NNSA perspective it also exercises the talents and pushes the technical skills of the nuclear security enterprise—both the labs and plants. Overall, it is one of the most important programs in which the NNSA is currently engaged. It is also critical to appreciate the complex integration and interdependency of these LEPs. Today, NNSA is delivering W76-1 life extended warheads to the Navy, and we have active LEP work on over 80% of today's stockpile. Funding uncertainty can have a great impact not just on one critical LEP but rather a cascading effect on the integrated schedule of LEP work across the nuclear security enterprise and our ability to synchronize the NNSA work on warheads with the DoD delivery platforms, as outlined under the 3+2 strategy. In addition, the research, development, testing and engineering of the Stockpile Stewardship Program is critical. It allows us to not only certify our current stockpile without returning to underground nuclear explosive testing but to also develop predictive capabilities through our suite of experimental facilities and supercomputers that conduct simulations and experiments on future LEP concepts. Finally, we also remain focused on modernizing the supporting infrastructure--whether it is for plutonium at Los Alamos, uranium at Y-12, high explosive pressing at Pantex or non-nuclear component production at the Kansas City Plant—ensuring we have the base capabilities to support these LEPs and the workforce to carry out this highly technical work is paramount.

Conclusion

Sustained support for the completion of the B61-12 will enable the retirement of the B83, the last megaton-class weapon in the U.S. arsenal, and will result in a reduction in the total number of nuclear gravity bombs in our stockpile by a factor of two, and a reduction in the amount of special nuclear material in the total number of gravity bombs by more than a factor of six. Other strategies to extend the life of the many current variants of the B61 and the B83 would likely be double the cost compared to continuing progress on the B61-12. The B61-12 is part of

an integrated national strategy for the future of the stockpile. The "3+2" Strategy provides responsiveness to the inherent uncertainty of the future global security environment with a capability that is more safe, more secure, with fewer weapons and less destructive power. I cannot endorse an alternative strategy for the weapons complex that is less safe, less secure, and that requires more weapons with greater destructive power, all at higher cost to the taxpayer.

It will take patience and persistence to achieve the goals of the "3+2" Strategy and to execute this B61 LEP. We will never get there if we do not continue the clear-minded implementation of the 2010 Nuclear Posture Review and associated decisions. I ask that you join me in supporting these concrete steps toward realizing these nuclear modernization goals.

National Nuclear Security Administration

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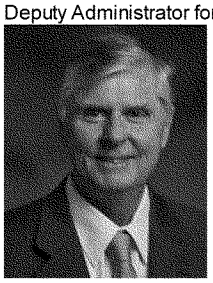
Dr. Donald L. Cook

Deputy Administrator for Defense Programs



Dr. Donald L. Cook serves as the Deputy Administrator for Defense Programs at the National Nuclear Security Administration. Appointed to the position by President Barack Obama, Dr. Cook was sworn in as NNSA's 5th Deputy Administrator in June 2010. He is responsible for managing the U.S. nuclear security enterprise of laboratories and manufacturing facilities.

Prior to his appointment to NNSA, Dr. Cook served as Managing Director and Chief Executive Officer of the Atomic Weapons Establishment in the United Kingdom from 2006 to 2009. In this capacity, he was accountable for AWE's performance on the contract with the UK Ministry of Defence, which includes support of the UK Trident warheads and development and sustainment of capability in nuclear weapon design, engineering development, manufacturing, qualification, assembly, transport, support in service, and finally, decommissioning, dismantlement, and disposal. AWE has an annual budget of $1.2 billion and an employee workforce of 5,000.

From 1977-2005, Dr. Cook worked in Pulsed Power Sciences, Microtechnologies, Infrastructure, and Security at Sandia National Laboratories in Albuquerque, New Mexico. From 1999-2005, he was Director of the MESA Program Center, accountable for design and construction of the Microsystems and Engineering Sciences Applications (MESA) complex. In 2003, he assumed Program Director responsibilities for Sandia's Infrastructure Program and for Sandia's Safeguards and Security Technologies Program.

From 1977-1999, Dr. Cook led efforts in pulsed power accelerator design and experimentation, fusion research, hydrodynamics, radiography, diagnostic development, and computational code development. He managed the Sandia Fusion Research Department from 1984-1993 and was Director of Pulsed Power Sciences from 1993-1999. Work during this period included

construction and development of a number of accelerators, including the Z-machine.

Dr. Cook is a graduate of the University of Michigan and the Massachusetts Institute of Technology, and a Fellow of the American Association for the Advancement of Science (AAAS) and the Institute of Physics (IOP). He is married to the former Margaret Ann Kramer, with two grown daughters, Julia and Cynthia.

Statement of Dr. Paul J. Hommert

President and Director

Sandia National Laboratories

Committee on Armed Services

Subcommittee on Strategic Forces

United States House of Representatives

October 29, 2013

Introduction

Chairman Rogers, Ranking Member Cooper, and distinguished members of the Strategic Forces Subcommittee, thank you for the opportunity to testify today on "Nuclear Weapons Modernization Programs: Military, Technical and Political Requirements for the B61 Life Extension Program and Future Stockpile Strategy." I am Paul Hommert, President and Director of Sandia National Laboratories. I am pleased to join here today General C. Robert Kehler, Commander, U.S. Strategic Command; Madelyn R. Creedon, Assistant Secretary for Global Strategic Affairs; and Dr. Donald L. Cook, Deputy Administrator for Defense Programs, National Nuclear Security Administration (NNSA). I will first take the opportunity to congratulate General Kehler on his upcoming retirement and to thank him for his commitment to the nation's nuclear deterrent systems and for his tireless work devoted to our nuclear weapons modernization programs. In this context, I would like to highlight that, for the first time since 1992, Sandia is simultaneously executing three modernization programs, which are in full-scale engineering development: the B61 life extension program (LEP), the W88 Alteration (ALT) 370, and the Mk21 Fuze Replacement.

Sandia is a multiprogram national security laboratory owned by the United States Government and operated by Sandia Corporation[1] for the NNSA. Sandia is one of the three NNSA laboratories with responsibility for stockpile stewardship and annual assessment of the nation's nuclear weapons. Within the U.S. nuclear weapons enterprise, Sandia is uniquely responsible for the systems engineering and integration of the nuclear weapons in the stockpile and for the design, development, qualification, sustainment, and retirement of nonnuclear components of nuclear weapons. Sandia's nuclear weapons mission is focused on three imperatives. First, take care of the U.S. current stockpile through, for example, annual surveillance, as well as provide for stockpile maintenance through limited-life component exchange; second, sustain the stockpile into the future through

[1] Sandia Corporation is a subsidiary of the Lockheed Martin Corporation under Department of Energy prime contract no. DE-AC04-94AL85000.

LEPs and ALTs, which include technology replacement to avoid strategic surprise; and third, maintain and advance Sandia's required engineering and science capabilities, operations, and infrastructure.

While nuclear weapons represent Sandia's core mission, the science, technology, engineering, and business professional capabilities required to support this mission position us to support other aspects of national security as well. Indeed, there is natural, increasingly significant synergy between our core mission and our broader national security work, including research and development in synergistic defense products, cyberspace, nuclear assessments and warning, and global nuclear dangers. Examples of areas where Sandia has applied its expertise with a direct nexus between nuclear weapons (NW) work and non-NW benefits for the nation include the development of tools for the warfighter to use in order to safely disable improvised explosive devices. This achievement was made possible by the deep expertise in explosives required for our NW mission, global monitoring systems for nuclear material detection, and our contributions to cyber defense, which are enabled by our long-standing work in the command and control of nuclear weapons.

Major Points of This Testimony

My statement today before this subcommittee will focus on the requirements driving the B61 LEP and the current program status. I also will touch on Sandia's role in the overall "3 + 2" future stockpile vision.

Ms. Creedon is representing the U.S. policy perspective at this hearing, General Kehler is representing military requirements, and Dr. Cook will provide an enterprise-wide perspective for the NNSA. Sandia's role is to work within the NNSA enterprise to provide technology and products that support the implementation of U.S. policy and meet military requirements. Following are the major points of my testimony:

1. In order to sustain high confidence in the safety, security, and reliability of the B61 into the next decade, it is our technical judgment that we must complete the life extension program currently being executed.
2. We are well into the full-scale engineering development phase of this program, with the baseline design review scheduled for September 2015.
3. To date, we have costed $253 million of the $2.65 billion estimated incremental cost for Sandia on the B61 LEP, which was specified in the Weapon Development Cost Report (WDCR).
4. At Sandia, **we met all major FY13 program milestones for the B61 LEP** on (or under) cost although sequestration caused some of the work scope to be deferred to FY14.
5. We put in place rigorous project management expertise to ensure **ongoing adherence to plan for all our modernization efforts**.
6. We have drawn upon resources and expertise nurtured through interagency work on broader national security challenges to meet the urgent demands of our core nuclear weapons mission.
7. However, the impacts—both to schedule and lifecycle cost—of ongoing FY14 budget decisions have yet to be established. It is likely that we will have delays in schedule and higher costs.

The B61 LEP: Sustaining the B61 Safety, Security, and Reliability

Every year, the directors of the three NNSA national security laboratories and the commander of U.S. Strategic Command (STRATCOM) are required by law to assess the state of health of the U.S. nuclear weapons stockpile. Based on an extensive technical evaluation, Sandia's director submits a letter to the secretaries of Energy and Defense and the chairman of the Nuclear Weapons Council (NWC), assessing the reliability and safety of each U.S. nuclear weapon type and noting potential concerns.

Regarding the B61, in recent years, my letters have documented concerns related to technology obsolescence and aging. While the B61 is currently safe and secure, these concerns continue to increase. For example, in the past three years, we have observed time-dependent degradation not seen before in electronic, polymer, and high-explosive components. This observation is not surprising given the age of the B61 weapon system, the oldest units of which were manufactured and fielded in the late 1970s with some components dating back to the 1960s. As planned, the B61 LEP we are currently executing addresses all known aging-related issues.

The program is also addressing technology obsolescence. Electronic components of the B61 were designed and manufactured decades ago. Outdated technologies, such as vacuum tubes, are exhibiting performance degradation and are difficult to evaluate and assess with confidence. The new radar for the B61 LEP will be based on the modern technology of radio-frequency integrated circuits.

This life extension also contains an explicit approach to trusted design. For example, we are manufacturing all application-specific integrated circuits in Sandia's trusted foundry.

Encryption algorithms, which are fundamental to the security of the B61, are assessed by the National Security Agency to have certain upcoming expiration dates, so key features associated with use control and denial must be upgraded.

The B61 receives important signals from the aircraft used to deliver it, and the aircraft interface of the B61 needs to be updated from analog technology to an adaptable interface that can also accommodate digital technology to ensure compatibility with planned future aircraft upgrades and the F-35 Joint Strike Fighter.

Following direction from the Project Officers Group, chaired by the U.S. Air Force, the B61 LEP will consolidate four of the current versions, or Mods, of B61 bombs (the B61-3, B61-4, B61-7, and B61-10) into a single Mod, the B61-12. The result will be reduced U.S. Air Force nuclear weapon management complexity, as well as reduced cost for ongoing maintenance, training, and stockpile evaluation. With the B61-12, there will be just one weapon type. This Mod consolidation is made possible through use of a Tail Kit, which is the responsibility of the U.S. Air Force and is designed to provide increased targeting accuracy. In turn, increased accuracy allows the military yield requirement to be lowered for the LEP design.

B61 LEP updates, including Mod consolidation into just one weapon type, will overall dramatically reduce the amount of special nuclear material for this weapon type. Updated safety and security features also will be included in the B61-12, consistent with presidential directives and national policy.

In summary, the B61 LEP includes a prudent mix of the following:

(1) Requalification and reuse of existing components that we can certify for an additional 20-year lifetime,
(2) Remanufacture of some existing component designs, and
(3) Replacement with new designs, where required.

This approach to the program reduces the number of components to be developed and reduces the technical and programmatic risk associated with the life extension, but it does add lifetime risk to the B61-12. The resulting B61-12 design is the minimum that

- Meets threshold military requirements, including compatibility with future digital aircraft interfaces,
- Addresses known end-of-life and technology obsolescence issues,
- Updates safety and security over the currently fielded systems, and
- Consolidates the B61 Mods 3, 4, 7, and 10 into a single B61 Mod 12.

Cost and Schedule Performance on the B61 LEP

NNSA has provided to Congress an estimate of approximately $8 billion over 12 years for the full program just described, including the production and deployment of the required number of nuclear bombs. Within that cost estimate, there is a $2.65 billion estimated total incremental cost for work on the B61 LEP at Sandia, which was specified in the WDCR. This estimated cost includes an appropriate amount of contingency. There are additional resources applied to the B61 LEP from base capability programs; however, these are relatively small and would be costed for capability sustainment independent of the B61 LEP.

Thus, from our perspective, the most relevant cost number for the B61 LEP work at Sandia is $2.65 billion. This cost represents approximately 40% of the incremental cost for the B61 LEP across the enterprise. At the time of this testimony, we have costed $253 million of the $2.65 billion. Against those expenditures, we have met all major milestones on (or under) cost. These milestones include system-level mechanical environment tests, radar flight performance tests, and functional electrical compatibility tests.

The B61 LEP can be thought of as having three major phases—design, component and system qualification, and production. We are currently approximately 60% complete on design, with baseline design review scheduled for September 2015. In FY14, work on qualification will increase.

There has been considerable discussion about schedule slip or cost growth on the B61 LEP. With respect to this topic, I can only address Sandia's role; however, as the predominant design agent for the LEP, we recognize the impact of our work on the overall enterprise schedule.

Regarding schedule, there are two overarching causes for slip: technical issues and budgetary changes. With respect to technical risk, I have the highest level of confidence that technical issues will NOT cause impact to Sandia's schedule performance. I say this for two reasons. First, we do not view this program as inherently high technical risk, especially when compared with other product development programs conducted at Sandia. The B61 LEP does not involve significant changes to environmental or functionality requirements; therefore, the inherent technical risk is

lowered. Second, we manage our contingency funds (~10%) in a manner that continuously buys down risk against a formalized risk register. So, for example, higher risk elements of the program, such as Tail Kit integration or component reuse, receive early and enhanced focus. As mentioned, we are well into program execution, and early success supports our confidence. For example, at the start of our full-scale engineering development, the radar component was high on our risk register. As you may be aware, in August we tested our new radar for the B61-12. The test of the new design was so successful that we have decided to eliminate two additional tests that were originally planned, saving an estimated $300,000.

With respect to budgetary changes, I cannot be as sanguine. In FY13, sequestration impacts caused some technical activities to be moved into FY14. We estimated the schedule impact of those shifts to be relatively small—on the order of 2 to 3 months over the life of the program (within overall schedule contingency). However, at the time of this testimony, we are operating against a FY14 resource allocation that, on an annual basis, is at least 23% below the FY14 requirement, as contained in the most recent NNSA-approved Baseline Change Requests to the Selected Acquisition Report, approved in October 2013. Obviously, unless addressed, budgetary changes of this magnitude will have significant schedule impact. As with any large program activity, schedule slip will result in an increase in overall program cost. We recognize the overall fiscal environment in which we are operating and will work at all times to minimize cost growth as a result of budget-induced schedule slip.

Another aspect of cost growth is labor rates. We are committed to managing labor costs and have confidence in our forward pricing rates used in our cost estimate, which take into account upcoming changes in pension and health care cost obligations. Once again, our initial performance validates our confidence as our labor costs for FY13 and now FY14 are modestly below the forward pricing rates we used in our cost estimate.

Achieving a High Level of Programmatic Performance

As illustrated by data in the section above, we have achieved a high level of programmatic performance on the B61 LEP and, indeed, the same is true of the two other modernization programs in full-scale engineering development at Sandia—the W88 ALT 370 and Mk21 Fuze Replacement. This achievement was the result of the deliberate and focused efforts of our leadership over the past several years.

Among these efforts are collocation of the core design teams, enhancements to our classified networks reflective of the volume of work, and most significantly, staffing and training of the workforce. The staffing requirement for these modernization efforts exceeds 1,000 people. I am pleased to report that, despite numerous periods of budget uncertainty over the past two years, we have been extremely successful at staffing the program against a very aggressive staffing plan. Two staffing approaches have allowed us to achieve the required staffing levels for the modernization programs: (1) internal staff movements from other Sandia programs that require skills synergistic with those for the nuclear weapons program and (2) external hiring. Since 2010, we have hired some 500 advanced-degree scientists and engineers. The overall number of members of the workforce at the Laboratory remained essentially flat through this period. Of those we hired new to Sandia,

approximately 58% are early in their professional careers. The modernization program provides opportunities for these new technical staff to work closely with our experienced designers: from advanced concept development to component design and qualification, and ultimately to the production and fielding of nuclear weapon systems. It is very important that we provide individuals such as these with an environment where they can undertake the multiyear learning it takes to technically steward the nation's nuclear stockpile now and into the future, after the modernized warheads are in the stockpile. We have a new and strong contingent of scientists and engineers prepared to take on that challenge, and we must strive to provide the stability, focus, and national commitment that will enable their success.

Finally, another major effort of our leadership has been implementing an increased level of project management rigor. Our technical experts are partnered with project management professionals, skilled practitioners using a suite of formal tools, such as resource-loaded schedules, requirements tracking systems, and sophisticated risk management and mitigation methods. We are moving to an Earned Value Management System (EVMS), which is a way of quantitatively measuring where one is in the execution of a project regarding schedule and cost. While these approaches add to execution overhead, they provide essential insights and early indicators for a project of this scope and duration. With EVMS, we can use tailored assessments to look at cost and schedule performance indicators on a monthly basis, examine each subsystem, and track more accurately how each team is doing in developing those subsystems—and we can make immediate, early changes if necessary, applying more or fewer resources to each particular element of the project, as required.

We believe Sandia has an achievable plan, and today we continue to be on schedule and on budget relative to the March 2020 first production unit (FPU) documented in the Selected Acquisition Report. We are adjusting our plans as the fiscal situation evolves and are confident that we have the expertise and tools in place to effectively manage the program going forward.

Further Modernization Efforts at Sandia

The B61 LEP is the first and most urgent in a series of LEPs and ALTs required to sustain the U.S. nuclear stockpile into the future, in keeping with the "3+2" strategic vision of the stockpile codified in the NWC-approved baseline plan. We share the vision of a 3+2 stockpile, although the pace and sequencing of the path to that vision are not yet fully known and will be driven by global security imperatives and moderated by fiscal realities.

Our successful record of using common technologies and components across multiple systems that have been deployed in the U.S. stockpile has helped reduce development risk and manage development costs. We are extending this approach to development of the Arming, Fuzing, and Firing (AF&F) system. Today, a modular AF&F design is being developed for the W88 ALT 370, the Mk21 Fuze Replacement, and potentially for the W78/88-1 LEP. By capitalizing on work we have done over the past decade on modular warhead architectures and adaptable nonnuclear components, Sandia is supporting the NWC's plan for stockpile modernization cost-efficiently and with reduced risk. Although not directly interchangeable to accommodate missile interface differences, the underlying technologies and components are eminently adaptable to each of these

warhead applications and thus result in cost savings and reduced risk. In addition to the ballistic missile warhead applications, these same technologies and, in some cases, nearly identical components are being used in the B61 LEP. As in the past, rigorous performance testing in qualification, production, and surveillance mitigates the common-mode failure risks attendant to this approach. In addition, the microelectronics fabrication complex at Sandia and the Kansas City Plant provide the nation with a secure, responsive infrastructure for addressing production or design issues if they arise.

W88 ALT 370

Sandia is currently executing full-scale engineering development (Phase 6.3) on the W88 ALT 370, which involves replacing the AF&F system. The current FY19 FPU schedule for the W88 ALT 370 is driven by the overall Navy program and schedule, components reaching their end of life, and the need for additional surveillance quantities.

Mk21 Fuze Replacement

The W87 Arming and Fuzing Assembly, an Air Force subsystem, requires replacement with a current plan for an FPU in FY20. Alignment of this program with the B61 LEP and W88 ALT 370 allows the Air Force to receive approximately $85 million in savings as a result of using the common radar module. Use of other common and adaptable components will result in additional savings. This program is funded entirely by the Air Force. We have recently entered Phase 6.3 for this program as well.

Together, the B61 LEP, W88 ALT 370, and Mk21 Fuze Replacement, provide substantive required upgrades to all three legs of the U.S. nuclear weapons triad. That force posture has been consistently reaffirmed through official U.S. national security policy reviews and most recently in the updated *Guidance for Nuclear Forces Employment* transmitted to Congress.

W78/88-1 LEP

With a longer time horizon, we are working with NNSA and the Department of Defense (DoD) to study options for the W78/88-1 LEP. We completed a 120-day study, which was a tri-lab effort to examine options for reentry system modernization to include warheads that are interoperable across both the Intercontinental Ballistic Missile and Submarine Launched Ballistic Missile legs of the triad.

Additional Modernization Efforts

We delivered to NNSA preliminary reports on the options and considerations for the Long-Range Standoff Cruise Missile or Air-Launched Cruise Missile replacement.

Sustaining the Current Stockpile

Sandia, together with the other two NNSA national security laboratories, has key responsibilities in ensuring the safety, security, and effectiveness of the nation's nuclear deterrent. The stockpile surveillance and assessment program plays a crucial role in establishing that required confidence in our nuclear deterrent. It is through stockpile surveillance that nuclear weapons are taken apart to test

the components. Test results provide the necessary data to help us assess the safety, security, and reliability of the stockpile.

Stockpile Surveillance and Assessment

Findings from conducting this program provide the technical basis for our annual stockpile assessment reported to the President of the United States and inform decisions about required elements of the life extension programs and their timelines.

Multiple drivers heighten the importance of the surveillance program. Among them are the following: an unprecedented age of the stockpile, which includes many subsystems that were not originally designed for extended life; smaller stockpile numbers, which heighten the importance of individual warhead reliability; scoping decisions for stockpile life extensions; and for at least the next 20 years, surveillance of a stockpile that will contain simultaneously both our oldest weapons and life-extended weapons. The latter group must be examined for possible birth defects and for further aging of reused components.

The FY13 funding allocation after sequestration impacts required that we constrain surveillance efforts; current indications are that the FY14 funding for Sandia will impose additional constraints on our surveillance program. Despite funding constraints, Sandia is committed to fully support the flight test program with the DoD. However, we cannot provide annual laboratory testing, as historically we have done, for each system in the stockpile. The testing period will have to be stretched out. At the same time, our efforts to implement the component testing and new diagnostics and models fall further behind. These capabilities provide understanding of margins, uncertainties, and trends needed to (1) ensure the stockpile is safe, secure, and effective; (2) understand the lead times necessary to respond to aging issues that would have the potential to reduce stockpile safety, security, or reliability; and (3) support decisions on scoping for stockpile life extensions. Furthermore, several of our key surveillance facilities located in New Mexico, California, Texas, and Nevada are being operated with minimal investments in spare parts and preventative maintenance; as such, we are at risk for extended test outages due to equipment failures. To minimize the risk to the stockpile, given the realities of the current fiscal environment, we continue to apply a risk-based prioritization of our surveillance activities. A reduction in the number of systems requiring surveillance can also mitigate the pressure on the surveillance budget. Successfully completing the current modernization efforts should enable decisions regarding any reductions in stockpile types or numbers.

Advancing the Tools of Stewardship

During the stewardship era, the quintessential challenge was the elimination of underground testing. The sustained support received for stewardship has allowed us to make enormous progress in our understanding of nuclear weapons function in the absence of underground testing and has enabled us to attract talented staff. We must continue to advance and apply the tools of stewardship during today's modernization era.

Science-Based Infrastructure and Capabilities

Sandia's capabilities are essential to its full life-cycle responsibilities for the stockpile: from exploratory concept definition to design, development, qualification, testing, and ultimately to ongoing stockpile surveillance and assessment.

The FY13 funding for the recapitalization of our silicon fabrication facility, the requirements for which I have addressed in prior testimony, enabled us to replace the single most-expensive and highest-risk item in the facility. The FY14 budget must support the recapitalization program at the planned level.

I will restate that Sandia stewards for the nuclear weapons program, as well as for the Department of Energy's nonproliferation payloads, the microelectronics research and fabrication facility, where we design and fabricate an array of unique microelectronics, specialty optical components, and microelectromechanical system devices. The FY14 budget, to which we are currently planning, negatively impacts recapitalization and will increase the risk for delivering the B61 LEP and for producing the radiation-hardened components required by the W88 ALT 370 and all future reentry system LEPs. As we go forward on modernization, our microelectronics fabrication facilities, which form the basis of our trusted foundry, will be critical to ensuring the integrity of our supply chain.

In addition to the silicon fabrication facility, we have significant recapitalization needs at various experimental and test facilities critical to the success of the B61 LEP, W88 ALT 370, and future LEPs, particularly at the Tonopah Test Range. The FY14 budget will hamper our ability to reduce risk to the modernization program through lack of investment in those capabilities.

Sandia's high-performance computing capabilities are vital tools for our mission responsibilities in stockpile surveillance, certification, and qualification, and they continue to prove to be indispensable to our broader national security work. Current indications are that the FY14 budget negatively impacts our high-performance computing capabilities.

I want to emphasize that the investments in our stewardship tools over the past 15 years enable cost reductions in our modernization efforts through increased use of computational simulation, which reduces the amount of qualification testing; allows, for the first time, confident qualification of some components without either nuclear testing or expensive aboveground facilities; and affords important insights into the challenge of predictive aging for our older stockpile.

Synergy between Our Nuclear Weapons Mission and Broader National Security Work

Today's national security challenges are complex and highly diverse. The NNSA laboratories are contributing solutions to those challenges. To energize and sharpen its nuclear weapons competencies, Sandia relies on its broader national security work. The symbiotic relationship between the nuclear weapons mission and broader national security missions prevents insularity and creates a challenging, vigorous scientific and engineering environment that has helped us attract and retain the new talent we need. Such an environment is essential for us to succeed against the

challenges we now face. Let me give you two examples that highlight the way in which this symbiotic relationship works at Sandia.

First, I will give a technology example. Sandia has led the development of real-time processing and high performance-to-volume ratio technologies for synthetic aperture radar (SAR). Both technologies were made possible by our extensive radar design and development work for nuclear weapon fuzing. The technologies have been leveraged and are currently used by the DoD. The extensive SAR work has sharpened our radar design competencies and kept Sandia aligned with advances in radar technology, such as radio-frequency integrated circuits. We applied these modern technologies to the design of the replacement radar for the B61 LEP, the W88 Alt 370, and the Mk21 Fuze Replacement with a high degree of commonality, which leads to cost savings.

My second example is Sandia's satellite program, which spans about five decades and has grown steadily with numerous customers. This program, which provides our nation with critical national security capabilities, has brought with it a very rigorous program-management environment for moving advanced technology within tight schedule requirements. We have leveraged the knowledge accumulated in these areas to our nuclear weapons program.

I strongly believe that today it is not possible for my Laboratory to deliver consistently on the commitments to the nuclear weapons program without the synergistic interagency work that attracts top talent, hones our skills, and provides stability through the cycles of the nuclear weapons program.

Government commitment to the broad national security work of the laboratories is essential for the United States to ensure the preeminence of our nuclear weapons and to enable multidisciplinary technical solutions to other complex and high-risk national security challenges. In no way does our interagency work detract from our focus to execute our core nuclear weapons mission.

Conclusions

We are committed to continuing to provide the leadership and management expertise and attention required for successful execution of the stockpile modernization programs consistent with national security policy, NWC authorization, military requirements, NNSA direction, and congressional funding. As a Federally Funded Research and Development Center, we are dependent on timely, stable funding allocations, and encourage your support to the extent possible in this environment.

We appreciate the many ways in which Congress has supported the nuclear weapons program over the past few years, most notably with anomalies to spend at rates associated with the full President's budget requests for Weapons Activities during continuing resolutions and approval of reprogramming requests. At Sandia this approach has allowed us to stay largely on track for these critical programs.

We continue to struggle with the uncertainty associated with possible continuing resolution and sequestration outcomes, and the numerous and wide-ranging funding scenarios for support of this program in FY14 and beyond. Timely resolution of these issues is critical to sustaining morale and retention of our staff, and to staying on track with the scope and schedule required to support

U.S. nuclear deterrent objectives. We welcome continued communication between congressional committees and the national laboratories so we can be fully aware of possible and probable outcomes and can plan accordingly.

Finally, I want to end on a personal note. In a professional career now spanning more than 37 years, I have had the extraordinary privilege to work at three institutions whose core responsibility is nuclear weapons: the Atomic Weapons Establishment in the United Kingdom, the Los Alamos National Laboratory, and of course Sandia National Laboratories. In that time, I have worked with many exceptional individuals who have dedicated their professional lives to the innovation, science, and engineering excellence required to ensure that these unique devices of mankind are safe, secure, and reliable. I fully recognize the fiscal environment in which we are operating, and throughout my testimony I have indicated our focus on cost management and cost efficiency. However, my experience deeply reminds me that nuclear weapons are the last place for half measures or corner cutting. Thank you for your support and for having us here today to testify.

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Sandia National Laboratories

BIOGRAPHY

Dr. Paul Hommert

President and Laboratories Director
Sandia National Laboratories

Dr. Paul Hommert is the director of Sandia National Laboratories and president of Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, which operates Sandia for the U.S. Department of Energy's National Nuclear Security Administration. Sandia has principal sites in Albuquerque, N.M., and Livermore, Calif., an operating revenue of about $2.5 billion, and approximately 9,400 employees.

Dr. Hommert began his career with Sandia as technical staff in 1976 and then gradually moved to holding positions of increased responsibility in a broad range of programs and management assignments. He initially led programs supporting energy research, and from the mid to late 1990s, he was director of engineering sciences.

From 2000 to 2003, Dr. Hommert was the director of Research and Applied Science at the Atomic Weapons Establishment in the United Kingdom, where he led the science and engineering organization responsible for the United Kingdom's nuclear deterrent.

From 2003 to 2006, Dr. Hommert led the Applied Physics Division at Los Alamos National Laboratory. The division was responsible for nuclear weapon design and assessment, weapon performance code development, and weapon science support.

In 2006, Dr. Hommert returned to Sandia to become vice president of Sandia's California site, a position he held until 2009. In 2009, Dr. Hommert moved to Sandia's main site in Albuquerque to become executive vice president and deputy Laboratories director for the Nuclear Weapons Program. In July 2010, Dr. Hommert became the director of Sandia National Laboratories and president of Sandia Corporation.

Dr. Hommert earned a BS degree cum laude in mechanical engineering from Rensselaer Polytechnic Institute and MS and PhD degrees in mechanical engineering from Purdue University. He received an Outstanding Alumnus Award for Professional Excellence in 2003 from Purdue's School of Mechanical Engineering and a Distinguished Engineering Alumni Award in 2010 from Purdue's College of Engineering.

In 2013, Dr. Hommert was named Laboratory Director of the Year by the Federal Laboratory Consortium for his support of Sandia's technology transfer activities. The award recognizes federal laboratories and their industry partners for outstanding technology transfer efforts and has become one of the most prestigious honors in technology transfer.

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U.S. DEPARTMENT OF ENERGY NNSA

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March 2013

DOCUMENTS SUBMITTED FOR THE RECORD

OCTOBER 29, 2013

Document #1 - Provided by DOD and NNSA

B61-12 Life Extension Program

National Nuclear Security Administration

"After a comprehensive review....we can...**maintain a strong and credible strategic deterrent, while reducing our deployed strategic nuclear weapons** by up to one-third." *–President Obama, Berlin Germany, June 19, 2013*

"As the United States **reduces** the numbers of nuclear weapons, the **reliability of the remaining weapons** in the stockpile...become more important." *– Nuclear Posture Review, Executive Summary, page xv*

The B61-12 Life Extension Program's (LEP) refurbishment of nuclear and non-nuclear components will allow for the consolidation and replacement of the four current B61 strategic and non-strategic weapon designs, and the retirement of the B83 strategic gravity weapon. By the end of FY2029 a successful B61-12 LEP will result in a:

- **53%** reduction in the total number of air delivered gravity weapons in the U.S. nuclear stockpile (active and inactive).
- **87%** reduction in the total amount of nuclear material utilized by air delivered gravity weapons in the U.S. nuclear stockpile.
- Significant reduction in the total nuclear yield (i.e., mega-tonnage) produced by air-delivered gravity weapons in the U.S. nuclear stockpile.

These planned reductions in the numbers of weapons, maximum yields, and amounts of nuclear material are dependent upon the successful completion of the B61-12 LEP. They are a key part of the Administration's long-term plan to demonstrate that we are meeting our NPT Article VI obligation to make progress towards disarmament.

" To sustain a safe, secure, and effective stockpile today, with the ultimate goal of a world free of nuclear weapons in the future, we must prudently manage our nuclear stockpile and related Life Extension Programs (LEPs)" *–Nuclear Posture Review, page 37*

The B61-12 LEP is the first tangible result of the Administration's development of a new approach to nuclear weapons stockpile sustainment, infrastructure modernization, and industrial base investment, outlined in the 2010 NPR, that allows for further reductions beyond New START treaty levels while still providing the ability to provide reliable worldwide deterrence for the U.S. and our global allies.

The following misperceptions of the B61-12 LEP continue to persist despite the Administration's efforts:

Misperception: The B61-12 LEP is only required if the U.S. maintains nuclear weapons in Europe to support NATO.

Fact: Consistent with Presidential policy guidance contained in PPD-24 and the 2010 Nuclear Posture Review, the U.S. will also maintain the capability to forward-deploy nuclear weapons with heavy bombers and dual-capable aircraft in support of extended deterrence and assurance of U.S. Allies and partners. These requirements would remain even if the weapons in Europe were to be withdrawn.

Misperception: The B61-12 LEP is an issue that only impacts our NATO commitments.

Fact: The capability offered by the B61-12 is important to our Allies and partners and demonstrates our commitment to extended deterrence. The Republic of Korea has demanded "visible and tangible displays" of the U.S. ability to make good on our commitment to maintain the capability to deploy nuclear weapons in time of crisis.

Canceling the B61-12 LEP would undermine our assurance commitments with regional allies, and could stimulate the debate in those countries about acquiring an indigenous nuclear deterrent; negatively impacting U.S. non-proliferation objectives.

Misperception: The Administration is planning to unilaterally remove the weapons from Europe.

"…we will work with our NATO allies to seek bold reductions in U.S. and Russian tactical weapons in Europe." *-President Obama, Berlin Germany, June, 19, 2013.*

Fact: In consultation with our NATO allies the Administration has committed to seek reductions in nuclear weapons with the Russian Federation. The President made clear his commitment to work with NATO and Russia on non-strategic nuclear weapon reductions during his remarks in Berlin this June.

Canceling the B61-12 LEP would complicate U.S. – NATO policy commitments to the nuclear deterrence mission, and risks reducing other, non-NATO Allies confidence in U.S. extended deterrence to NATO.

Misperception: There is a lower cost alternative to the B61-12 LEP, namely the "Triple Alt".

Fact: The "Triple Alt" does not meet threshold military requirements of Commander US STRATCOM and fails to address all of the aging concerns faced by the current B61 series of air delivered gravity weapons. Because of this failure to fix all of the aging issues an additional, follow-on refurbishment would be required, in addition to the "Triple Alt", thus greatly increasing the total life-cycle costs associated with this alternative.

The Nuclear Weapons Council (NWC) determined that the B61-12 LEP was the most cost effective option that DOES meet threshold military requirements.

Misperception: If we cancel the B61-12 LEP the cost savings can be realized elsewhere in the Federal Budget.

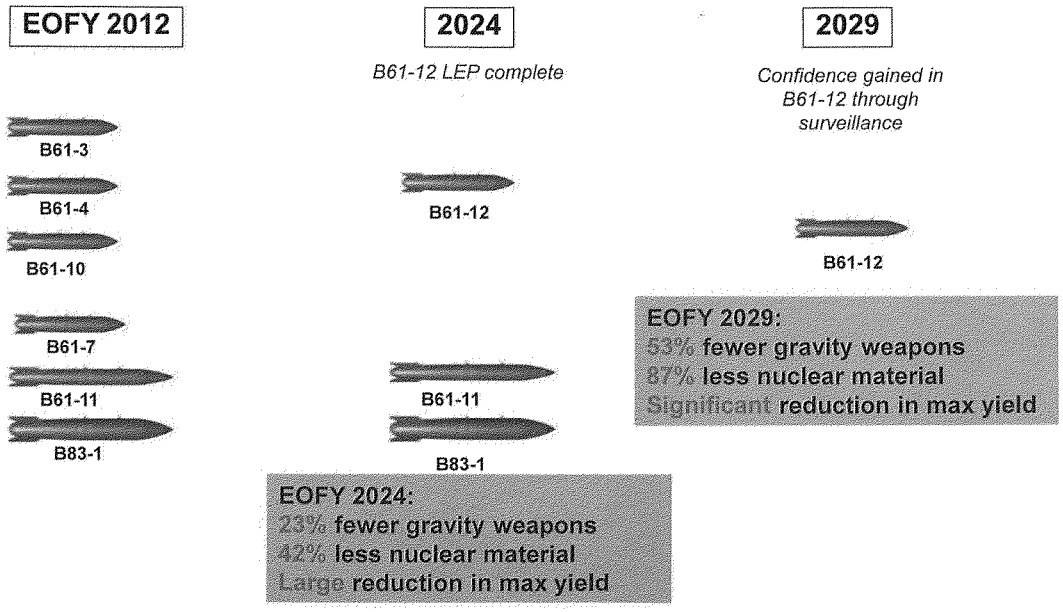
"Make no mistake: As long as these [nuclear weapons] exist, the United States will **maintain a safe, secure, and effective arsenal** to deter any adversary…" *-President Obama, Prague Czech Republic, April 5, 2009*

Fact: Much of the total cost for the B61-12 is for the design and development of non-nuclear components. These technologies will be leveraged in current and future LEPs, including the W78/88-1 interoperable warhead and the warhead for the new Long-Range Standoff cruise missile required to replace our aging deterrent in the coming years.

Canceling the B61-12 Life Extension Program (LEP) would offer few, if any, short-term budgetary advantages while creating significant long-term political, strategy, and budgetary repercussions. Such a decision would undermine – significantly and perhaps fatally – a broad set of administration strategies, objectives, and commitments.

Document #2 - Provided by NNSA

B61-12 LEP Enables Stockpile Reductions

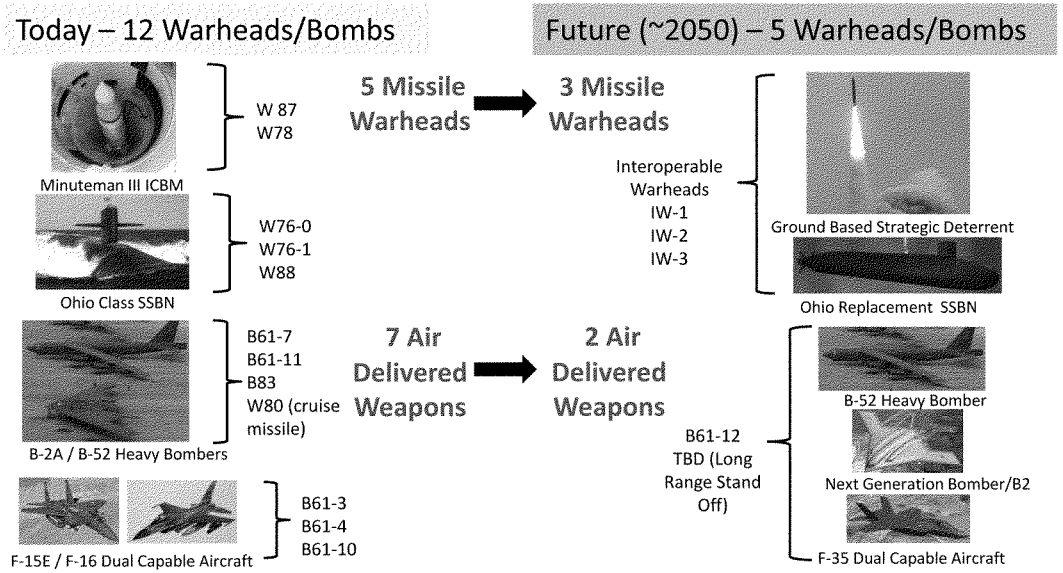


Source: NNSA FY2014 Stockpile Stewardship and Management Plan

Baseline (3+2) Strategy

Document #3 - Provided by NNSA

- Sustains a smaller deployed stockpile appropriate for New START and extended deterrence
- Balances the Triad, which enables a minimum hedge strategy and significant stockpile reductions
- Strengthens surety and reliability by removing conventional high explosives, replacing aging components, and improving margins
- Provides a consistent production workload
- Aligns platform modernization, warhead life extension efforts, and infrastructure modernization



HASC
Request for Information
4 June 13

B61-12 LIFE EXTENSION PROGRAM (LEP)

Strategic and Extended Deterrence:

- The B61 represents the cornerstone of long-term US extended deterrence to our allies, including NATO allies. It serves as key component of a broader strategy to accomplish the President's deterrence and non-proliferation goals outlined in the Nuclear Posture Review (NPR).
  - On 5 April 2009, President Obama stated the US is committed to a nuclear arsenal that is safe, secure and effective as long as these weapons exist.
  - In June 2009, the Secretary of Defense renewed the US commitment to extended deterrence in NATO.
  - The 2010 NPR reaffirmed the President's commitments.
  - The NWC directed the B61 LEP, and scoped it to address all aging and surety requirements.

- The US requires a nuclear gravity bomb capable of employment from B-2A, F-15E, F-16C/D, F-16 MLU, PA-200, and F-35A DCA to meet US national security objectives, NATO commitments and warfighter requirements. The B61 is the only weapon that is compatible with these platforms.

- The B61 LEP is essential to long-term viability of the B-2A gravity nuclear capability; it is required for the B-2A mission regardless of changes to NATO commitments.
  - As evidenced by recent events in North Korea, the visible credible nuclear capability provided by the B-2A is critical to demonstrating US resolve and providing deterrence options to the President in dealing with emerging crises.

- Particularly since retirement of the nuclear-armed tomahawk cruise missile (TLAM-N), the B61 is important to our Asia/Pacific allies who watch US actions closely to determine the extent to which we will honor our extended deterrence commitments.
  - Demonstrated commitment alleviates need for allied nations to pursue nuclear weapon programs because of US protection afforded them through assets that can be forward deployed.
  - Without the ability to provide this nuclear protection 'umbrella', our allies may elect to pursue weapons development in an effort to provide their own deterrent.

- US and NATO alliance is firmly committed to a maintaining a nuclear deterrent as long as nuclear weapons exist.
  - In May 2012, Deterrence and Defense Posture Review (DDPR), all NATO allies reaffirmed "As long as nuclear weapons exist, NATO will remain a nuclear alliance. The supreme guarantee of the security of the Allies is provided by the strategic nuclear forces of the Alliance, particularly those of the United States; the independent strategic nuclear forces of the United Kingdom and France, which have a deterrent role of their own, contribute to the overall deterrence and security of the Allies."

Nuclear Weapon Council (NWC) Actions:

- The NWC evaluated a subset of joint DoD/NNSA options to address B61 sustainment / refurbishment prior to selecting the current B61-12 scope (Option 3B).
  - Limited scope options (replacing the radar and limited life components) were rejected as not meeting minimum requirements.
  - Component replacement is not a viable sustainment strategy; it will not prevent a capability gap.
  - Current scope is the minimal scope option capable of meeting requirements.
  - These conclusions have been confirmed by independent, external reviews.

- The NWC determined executing a single LEP would maintain B61 effectiveness while reducing overall program and life-cycle costs, maximize opportunities to incorporate modern safety and security features, address long-term infrastructure constraints and enable a reduction in total stockpile size.
  - Single LEP deemed most effective means to maximize use of limited resources by modernizing strategic and extended air-delivered deterrence.
  - A LEP enables stockpile reduction through Mod consolidation.
  - A B61 LEP now precludes need for future more costly B83 LEP and will allow B-83 retirement.
  - The B61 LEP allows consolidation from four variants to one, which will save O&M costs in the long term; and will be the only nuclear bomb in the inventory.

Funding and Schedule:

- The B61 LEP is on-track to field required capabilities in time to avoid a capability gap in our strategic and extended deterrence missions.

- The B61 LEP schedule has already been delayed 2 years (from FY2017 to FY2019) and will not be completed until FY2024. Additional delays will place at risk our ability to meet warfighter operational commitments and US policy commitments to allies.

- NNSA is currently assessing FY2013 sequestration impacts to include anticipated limitations on carryover funding.
  - Initial estimates indicating a 6-month delay in production will be reported in the FY2013 Selected Acquisition Report for the B61-12.
  - NNSA is aggressively working to re-baseline FY13 activities and will make every effort to recover these delays.

- The B61 is a concrete manifestation of the US commitment to extended deterrence and assurance. Failure to fully fund the B61 LEP will be viewed by NATO and other allies as a weakening in the overall US extended deterrence commitment; potentially prompting certain allies to pursue their own nuclear program.

- As with all LEPs, B61 LEP is a multi-year program that requires consistent sustained funding to meet scope, budget and schedule. A Congressional hold on FY2014 B61-12 LEP funding will increase total required program funding and potentially introduce a capability gap by delaying first production of the B61-12.

Document #5 - Provided by NNSA

B61 LEP Cost Estimate Evolution—Why the Increase from 4B to 8B?

NNSA Information Paper – October, 2013

Summary:

The often cited $4B number is not an official program estimate or program baseline. NNSA developed the $4B number in FY2009 based on an extrapolation of the FY2011-FY2015 FYNSP budget following authorization of the Phase 6.2/2A study in 2009 and used the number as a place holder until the weapons design cost report (WDCR)was completed. The WDCR cost estimate for the B61-12 life extension program (LEP) was published in July 2012 and has not changed with the exception of FY 2013 sequestration cuts[1]. The current cost estimate reported in the May 2013 Selected Acquisition Report to Congress is $8.1B which includes $7.3B in direct B61-12 funding (including management reserve) and another $0.8B in other NNSA funds. NNSA is submitting quarterly updates to Congress on cost and schedule and will formally update the cost estimate following the Baseline Design Review to establish an Acquisition Program Baseline in FY2016.

The initial program estimate is officially established after the Phase 6.2A design definition and cost study is completed, the WDCR is accepted by Defense Programs, and a Phase 6.3 decision is approved by the Nuclear Weapons Council. The WDCR estimate is updated following the Baseline Design Review and documented in the Baseline Cost Report. NNSA has historically waited until after the baseline design, where design concepts are sufficiently mature and validated through development testing, to formally establish a cost baseline for tracking, referred to as an Acquisition Program Baseline.

The number developed in FY 2009 and used as a placeholder had low fidelity because design teams had not been formed, military requirements were still being confirmed, and historic cost data which to base an early estimate was limited[2]. The number also assumed a 2017 First Production Unit (FPU), which has since moved to FY2019. NNSA reported the $4B number in the FY 2012 Stockpile Stewardship Management Plan as a "parametric estimate" because production costs in FY2017-2022 were estimated using a historic development-to-production cost ratio. The FY 2012 Stockpile Stewardship Management Plan noted that the "definitive estimate" would not be established until after the completion of the WDCR and Phase 6.2A study in 2011. By "definitive" NNSA meant "official" cost estimate for the program using formal criteria based cost estimating process.

As part of the process for developing formal criteria, the Nuclear Weapons Council (NWC) considered four major options before the down-select into the current B61-12 design approach. The options included the Triple Alt, Option 1E (non-nuclear LEP), Option 3B (nuclear and non-nuclear with reuse),

[1] Sequestration underfunded the program. As a result, NNSA slipped the First Production Unit (FPU) from September 2019 to March 2020 and added $244M to the management reserve to offset the potential increased cost and risks with slipping the program six months. The first B61-12 Selected Acquisition Report to Congress, which formally documents weapon program cost and schedule, included the sequestration impacts.

[2] It important to note NNSA did not have detailed historic cost data on nuclear bomb components or processes for independently validating estimates prior to FY2012 based on the W76-1 activities. NNSA has moved to improve cost estimates and develop cost models for estimating and planning. This effort has resulted in improved confidence in the B61-12 official cost estimate and supports early planning estimates used for the FY2014 Stockpile Stewardship Management Plan.

and Option 2A-2D (full nuclear and non-nuclear LEP with enhanced surety capabilities). The initial estimates of decision cost ranged from $1.3B to $7.9B for a 2017 First Production Unit (FPU). A subset of the options also assessed FPU in 2019 to reduce schedule risk. The initial decision costs did not include all leveraged costs, risk management funding, and other elements that comprise a final program estimate. In December 2011, the NWC selected Option 3B with a 2019 FPU and directed NNSA to validate the cost estimate in the Weapon Design Cost Report by July 2012.

The WDCR cost estimate published in July 2012 is the initial cost estimate for the weapon program. NNSA used a "bottoms-up" cost estimating approach involving more than 40 product realization teams with representatives from each of the NNSA design and production agencies. The WDCR cost estimate followed the GAO cost estimating guidance using three-point estimates, risk based contingency analysis, and included management reserve. Component level costs are directly linked to the life extension option and comprised of both direct costs associated with design, development, procurement, and testing as well as system level integration and testing.[3] The estimate was internally, but independently reviewed and represents a formal commitment by each site on expected costs for the weapon program. (In contrast, the $4B was a top down estimate and lacked WDCR fidelity due to its early timing in the study and because it's primary purpose was to support budgetary planning and not to establish a program estimate.)

NNSA will update the B61-12 WDCR in FY2016 as part of the Baseline Cost Report prior to authorizing Phase 6.4 when the LEP design is approximately 90% complete and the program is beginning final design, pre-production, and system qualification activities. The Baseline Cost Report represents the Acquisition Program Baseline. NNSA acquisition and project management guidelines for capital construction projects are clear that baselines are not set until a 90% engineering design is established and the same concept applies to these major system acquisitions.

[3] A breakout of the component costs for the B61-12 LEP would provide an incomplete picture at both the component and B61-12 system level.) While aspects of the component design can be leveraged for alternative LEP options or systems, the integrated nature of the final assembly would make it impractical to disassociate these costs with the overall program estimate.

Document #6 - Provided by NNSA

HASC Questions on B61 LEP – October, 2013

Question: When would the second LEP for the 1E option be required?

Answer: Nominally, the B61 would require a follow-on nuclear LEP with an FPU target of approximately 2030. The Phase 6.1 request for a follow-on nuclear LEP would likely occur in 2019. This added nuclear LEP would run concurrently with the 1E LEP, which would have an FPU target of 2022 and production through 2026. In addition, NNSA would have to establish a third program to manufacture ALT 357 CSA's for the B61-7 with FPU in FY 2023 in order to sustain the legacy surveillance program. This confluence of program requirements would create a significant bow wave of cost and work.

Question: What would the savings be for switching to the 1E option?

Answer: Today, the study is over and the 3B Option is in its second year of engineering development. Switching to the 1E Option now would have only a small reduction in funding needs over the FYNSP and a much higher life-cycle cost for the LEP.

The Option 1E is roughly 70-75% the scope of Option 3B. Option 1E addresses only non-nuclear aging issues to assure the capability of the B61-3, 4, 7 thru 2030. Mod consolidation into a single bomb variant could not occur without the nuclear scope.

A switch from 3B to 1E would require re-start of the program extending the schedule for two years, force a redesign to make the non-nuclear components backward compatible with multiple legacy NEPs, and add the qualification effort for multiple mods. When combining the sunk costs (2009-2014), Option 3B close out (2014-2015), new Option 1E WDCR study costs (2014-2015), and Option 1E development and production costs (2015-2026) the total program cost for the 1E will be similar to completing the 3B as planned. We would then add B61-7 ALT 357 CSA production for surveillance, a new multi-billion-dollar follow-on nuclear LEP, and the increased sustainment cost of multiple mods.

The option requires negotiation with the DoD on military requirements, new development and production schedule, a new WDCR, and approval by the NWC – all of which would need to occur before any commitments to time scale or funding can be made. In summary, there is no cost advantage to restarting the LEP with the 1E option this late in the program.

Option Assessment

Option	EOL	Near Term Aging Risk	F-35	TKA	Mod Consolidation	Improve Safety	Improve Use Control	Service Life Long Term Aging Risk
Triple Alt (radar, power, NG)								
1E (non-nuclear LEP w reuse)								
Option 3B (full LEP with reuse)								
Option 2C (full LEP with surety)								

Option 2C Technologies: Direct Optical Initiation & Multipoint Safety

- **Triple Alt doesn't meet military requirements or assure no capability gap**
  - **Limited scope requires immediate pursuit of second LEP for near term aging issues**
  - **Radar requires redesign to address legacy bomb requirements**
  - **No aircraft compatibility with modern aircraft / System II / no mod consolidation**
  - **Need to renegotiate military requirements and schedules**
  - ***Does not allow for reduction in bomb quantities / retirement of B83-1***
- **Option 1E replaces most non-nuclear aging components / does not meet all military requirements**
  - **Requires redesign to integrate current design with multiple legacy NEP interfaces (12-24 month delay)**
  - **Limits safety improvement due to lack of ability to touch NEP components / interfaces**
  - **Requires second LEP to address nuclear components / potential duplicate scope & costs**
  - **Limits ability to mod consolidate**
  - **Need to renegotiate military requirements and schedules**
  - ***Does not allow for reduction in bomb quantities / retirement of B83-1***
- **Option 3B meets military threshold requirements at lowest life cycle costs**
- **Option 2C meets and exceeds military threshold requires but at increased cost and schedule risks**

Option Comparison

Triple Alt	Option 1E	Option 3B	Option 2C
Does not meet military requirements: safety exceptions, service life, aircraft compatibility/ system II, mod consolidation, maintenance period, yield, performance margin	Does not meet military requirements: not all safety exceptions, service life, mod consolidation, yield	Meets all military requirements (threshold)	Meets and exceeds military requirements (threshold)
Replaces NG, power and radars	Replaces NG, power, radars, aircraft interface and other non-nuclear aging components in the center bomb sub-assembly	Full LEP with reuse of non-nuclear and nuclear components	Full LEP with minimum non-nuclear reuse , adds enhanced surety technologies
Does not address all near term aging issues; requires second alteration / LEP before 2028	Address all near term aging issues; defers long term aging issues until second costly LEP	Address all near and long term aging	Address all near and long term aging
Potential for capability gap until second alteration	No near term gap	No capability gap	No capability gap
Schedule assessment no longer valid / requires redesign of radar and re-work of military requirements, schedule delayed needs to be assessed	Schedule assessment no longer valid / requires redesign of radar and re-work of military requirements, schedule delayed needs to be assessed	Best opportunity to hold 2019-2020 FPU	Schedule assessment no longer valid / requires redesign of system component for compatibility with enhanced surety technologies
No safety or security improvements	Some improvements in safety and surety	Maximizes improvements by addressing both non-nuclear and nuclear surety interfaces (no enhanced surety)	Maximizes improvements by addressing both non-nuclear / nuclear surety interfaces and adds DOI and MPS safety features
No nuclear scope or mod consolidation	No nuclear scope or mod consolidation	Reuses B61 pit and remanufactures mod 4 CSA	Reuses B61 pit and remanufactures mod 4 CSA
retains Mod 3/4/7	retains Mod 3/4/7	Consolidates into Mod 12	Consolidates into Mod 12
B83 retained	B83 retained	Enables retirement of B83	Enables retirement of B83

Larry D. Welch, General, USAF (Ret)
Henry G. Chiles, Admiral, USN (Ret)
Richard W. Mies, Admiral, USN (Ret)
Kevin P. Chilton, General, USAF (Ret)

10 September 2013

Dear Senators Mikulski, Shelby, Levin and Inhofe,

As former military commanders of the nation's nuclear deterrent, we write to share our concern with cuts proposed in legislation currently before the Senate, specifically, significant cuts to the President's request for the B61 gravity bomb Life Extension Program (LEP) for fiscal year 2014. We believe this cut, if enacted, would impact the future of the airborne leg of the U.S. nuclear deterrent, it would imperil our commitment to the security of our NATO allies, and, it would preclude significant reductions in the large non-deployed nuclear weapons stockpile that the United States maintains to hedge against technical and geopolitical risk.

Classified and unclassified information from our military leaders and national laboratory directors clearly indicates that if we do not execute the B61 LEP as currently planned, the bomb will encounter major reliability problems in the 2020s. To sustain this needed capability, the joint Department of Defense and Department of Energy Nuclear Weapons Council extensively evaluated options for the B61 LEP—including reduced-scope options—and selected the lowest cost option that meets minimum military requirements and fixes known reliability problems.

Recent statements from Administration officials make it clear that reducing the scope of the B61 LEP now will result in significantly greater costs in the 2020s when a second LEP for this bomb would be required.

Severely impeding the B61 LEP, as the pending Senate legislation would do, will undermine the United States' extended deterrent guarantee to our NATO allies. Without that confidence some of our allies may elect to develop nuclear weapons of their own. Such proliferation would be disastrous for international stability and U.S. national security.

Finally, the proposed cuts to the B61 LEP will interfere with plans to reduce the total number of U.S. nuclear weapons. Without the B61 LEP as currently programmed, the U.S. will be unable to consolidate four different variants of the B61 into a single variant—which will require retaining a larger total number of the bombs to meet military requirements. To achieve the desired smaller nuclear weapons stockpile, the individual retained weapons must be more reliable, safe, and secure. The B61-12 is the important first step to meet the needed conditions. It would be ironic if those who seek to reduce the numbers and role of U.S. nuclear weapons create the exact opposite result – i.e., increasing the number of nuclear weapons – by cutting the B61 LEP currently underway.

As the FY14 authorization and appropriations process continues, we strongly encourage you to support the B61 LEP in President Obama's budget request, which has the full support of the nation's civilian and military leadership. We appreciate your consideration and your service.

Sincerely,

Larry D. Welch	Henry G. Chiles	Richard W. Mies	Kevin P. Chilton
General, USAF (Ret)	Admiral, USN (Ret)	Admiral, USN (Ret)	General, USAF (Ret)

CC: Chairman McKeon
RM Smith
Chairman Rogers
RM Lowey

Annette Groth
Member oft he German Bundestag
Spokeswoman on Human Rights fort the Left Party parliamentary group

Annette Groth, MdB, Platz der Republik 1, 11011 Berlin

Rep. Mike Rogers, Chairman

House Armed Services Subcommittee on Strategic Forces

2120 Rayburn House Office Building

Annette Groth
Member of the German Bundestag
Spokeswoman on Human Rights for the Left Party parliamentary group
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Tel.: +49 (0)30 227 – 77207
Fax: +49 (0)30 227 – 76207
Email: annette.groth@bundestag.de

Berlin, 8th of October 2013

Dear Mr. Rogers,

on the occasion of the House Armed Services Committee hearing in the U.S. Congress on October 10, which will deal with the proposal to upgrade the B61 bombs based in NATO countries, I would like to express my support for the campaigns against such an upgrading of the B61 bombs. Te B61 is strategically obsolete, the costs of training NATO pilots for a nuclear mission are very high and the costs of acquiring and deploying the F-35 Joint Strike Fighter are rising.
But even more important: since I am a pacifist and have been struggling for peace all my life, I am opposed to nuclear weapons and the NATO nuclear sharing agreement in general.
I urge you not to decide in favor of the proposal and instead to contribute to make our world a little more peaceful!

Yours sincerely

Annette Groth

Prof. Dr. Aytuğ Atıcı
CHP Mersin Milletvekili
Dışişleri Komisyonu Üyesi

Rep. Mike Rogers, Chairman
House Armed Services Subcommittee on Strategic Forces
2120 Rayburn House Office Building
Washington, DC 20515

Dear Mr. Chairman,

I am writing this letter to express my thoughts on the B61 life extension program. The U.S. is preparing to refurbish the B61 bombs under the life extension program with the aim of keeping these nuclear bombs operational longer. In this regard, on October 10, the House Armed Services Subcommittee on Strategic Forces will hold a hearing on the B61 nuclear bomb.

Notwithstanding the efforts for refurbishment, the B61 nuclear bombs have become strategically obsolete. The proposed life extension program will be the most expensive warhead refurbishment in history if it will be approved. Both training pilots for a nuclear mission and deploying the F35 Joint Strike Fighter will be more costly than ever before.

In addition to concerns on technical and economic details in regard to the B61, I would like to draw your attention to the situation of Turkey, which hosts the B61 nuclear bombs. Hosting the B61 nuclear bombs with its four NATO allies (Belgium, Germany, Italy, Netherlands), Turkey will directly be exposed to negative consequences of having these bombs in its territory. According to respected sources, Turkey currently hosts between 60 and 70 B61 bombs at Incirlik air force base. However, given its fragile region with enduring armed conflicts and high risks of proliferation, the B61 life extension program may put Turkey's security and stability in jeopardy.

Moreover, the B61 life extension program contradicts with the efforts for non-proliferation and safer and more stable world. In the 21st century, proliferation of weapons of mass destruction (WMD) is a growing tangible threat and serious concern for Turkey. Being a party to all major international nuclear non-proliferation instruments, Turkey is an active participant of international efforts in this field. In this vein, Turkey has welcomed the UN Security Council Resolution 1540 on the non-proliferation of the weapons of mass destruction.

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Belge Geçer : 0 312 420 69 97
e-posta : aytug.atici@gmail.com
Adres : BBlok, Alt Zemin, 4. Banko, No:8
TBMM, Ankara

Given its economic and strategic costs and Turkey's political position vis-à-vis the WMD, as a member of Foreign Affairs Committee in Turkish Parliament, I would like to express my concerns that the proposed B61 life extension program will not serve the efforts for safer, more secure and stable world.

Sincerely,

Prof. Dr. Aytuğ Atıcı
Mersin Deputy in Turkish Parliament
Member of Foreign Affairs Committee

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Belge Geçer : 0 312 420 69 97
e-posta : aytug.atici@gmail.com
Adres : BBlok, Alt Zemin, 4. Banko, No:8
TBMM, Ankara

Member of the European Parliament

Brussels/Strasbourg, 21October 2013

Rep. Mike Rogers, Chairman
House Armed Services Subcommittee on Strategic Forces
2120 Rayburn House Office Building
Washington, DC 20515

Dear Mr. Rogers,

We noticed that the B61 Life Extension Program and Future Stockpile Strategy is the subject of a hearing in the House Armed Services Subcommittee on Strategic Forces.

This modernization of the B61 nuclear weapon is sometimes presented as needed to fulfill the US obligations towards its European allies and their expectations towards the US extended deterrence. As member of the European Parliament I would like to put into question this presentation of the opinions concerning the US extended deterrence in Europe.

In its Strategic Concept NATO consideres that *"the circumstances in which any use of nuclear weapons might have to be contemplated are extremely remote."* It is significant that the statement that *"nuclear forces based in Europe and committed to NATO provide an essential political and military link between the European and the North American members of the Alliance"*, included in the 1999 NATO Strategic Concept, was omitted in the new Strategic Concept.

I consider further deployment of B61 nuclear weapons as of no military value. All deterrence roles considered for the B61 tactical nuclear weapon in the actual circumstances can be accomplished by conventional military means.

The modernization and further deployment of the B61 is a waste of resources for both the US and Belgian air force.

The remaining B61 weapons are also presented as bargaining tool for the much larger amount of Russian nuclear weapons. In our opinion the continuing deployment of the B61 rather gives Russia an excuse to keep its tactical nuclear weapons deployed. Bold nuclear disarmament steps will be more

important incentives to bring Russia to the negotiation table than keeping B61's in Europe.

In Belgium there is a growing cross-party political consensus that the deployment of B61 nuclear weapons would best be ended. This opinion was expressed in resolutions of the Belgian Senate of 21 April 2005 and the Belgian Chambre of 13 July 2005, and was confirmed in several later resolutions like the Senate resolution of 29 January 2009.

In a 19 February 2010 op-ed, former prime ministers Guy Verhofstadt and Jean-Luc Dehaene, former minister of Foreign Affairs Louis Michel and former NATO Secretary General Willy Claes expressed their support for the withdrawal of US nuclear weapons. I fully support their statement: *"Ideally this [the withdrawal of US nuclear weapons from Europe] would take place in negotiation with Russia, to achieve a proportional reduction of Russian nuclear weapons. But sometimes we must dare to set an example and hope that it will be an inspiration to others."*

Fully respecting the autonomy of your decision making on this issue, I hope with this letter to have aided you in making an informed decision.

Yours sincerely,

Bart Staes, MEP (Groen-Greens)

Europees Parlement
Altiero Spinelli 7H141
60, rue Wiertz / Wiertzstraat 60
B-1047 Bruxelles/Brussel

SENAAT

Brussels, 16th of October 2013

Rep. Mike Rogers, Chairman
House Armed Services Subcommittee on Strategic Forces
2120 Rayburn House Office Building
Washington, DC 20515

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At the NATO Summit in Lisbon in 2014, NATO should agree to a withdrawal of B61 nuclear weapons from Belgian territory by 2016. We propose to start bilateral talks between our two nations to prepare the withdrawal. Should the Lisbon Summit fail to reach a consensus in favour of their removal, we shall ask our government to achieve their removal by 2016 through direct bilateral discussions with your government.

In its Strategic Concept NATO considers that *"the circumstances in which any use of nuclear weapons might have to be contemplated are extremely remote."* It is significant that the statement that *"nuclear forces based in Europe and committed to NATO provide an essential political and military link between the European and the North American members of the Alliance"*, included in the 1999 NATO Strategic Concept, was omitted in the new Strategic Concept.

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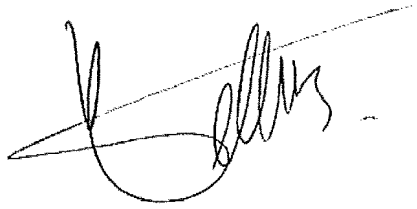
Yours sincerely,

Benoit Hellings,



Senator

Ecolo

Brussels, 16th of October 2013

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House Armed Services Subcommittee on Strategic Forces
2120 Rayburn House Office Building
Washington, DC 20515

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Yours sincerely,

Eva Brems

Member of Parliament

Groen

Juliette Boulet

Member of Parliament

Ecolo

Brussels, 16th of October 2013

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House Armed Services Subcommittee on Strategic Forces
2120 Rayburn House Office Building
Washington, DC 20515

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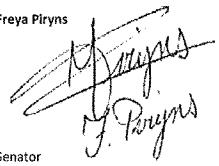
Yours sincerely,

Freya Piryns



Senator

Groen

Alliance of Baptists • American Friends Service Committee
Church of the Brethren • Conference of Major Superiors of Men
Disciples Center for Public Witness • Disciples Justice Action Network
Disciples Peace Fellowship • Episcopal Church
Evangelical Lutheran Church in America • Franciscan Action Network
Friends Committee on National Legislation • Islamic Society of North America
Leadership Conference of Women Religious • Maryknoll Office for Global Concerns
Mennonite Central Committee, U.S. Washington Office
National Council of Churches • NETWORK, A National Catholic Social Justice Lobby
Office of Social Justice of the Christian Reformed Church • Pax Christ USA
Presbyterian Church (U.S.A.) • Sisters of Mercy of the Americas
United Church of Christ, Justice and Witness Ministries
United Methodist Church, General Board of Church & Society
Unitarian Universalist Association

June 10, 2013

The Honorable Rodney P. Frelinghuysen, Chairman
The Honorable Marcy Kaptur, Ranking Member
Appropriations Subcommittee on Energy and Water Development
U.S. House of Representatives
2362-B Rayburn House Office Building
Washington, DC 20515

Re: Oppose funding for the B61 nuclear bomb

Dear Chairman Frelinghuysen and Ranking Member Kaptur:

As faith and religious leaders from across the United States, we are writing to express our concern and to urge you to **oppose funding for the B61 nuclear bomb refurbishment in the fiscal year 2014 budget**.

The existence, proliferation and possible use of nuclear weapons threaten all of God's creation. We are called by our faith to oppose nuclear weapons and urge Congress to end funding for these weapons. We see the elimination of the B61 nuclear bomb as the beginning of the elimination of all these weapons from our planet.

Currently, the United States stores about 200 B61 nuclear bombs at six bases in NATO nations: Belgium, Germany, Italy, Netherlands and Turkey. Another 200 are stored in the United States.

It is generally acknowledged that the B61 nuclear bomb does not enhance the security of the United States or NATO but instead serves as little more than a political symbol of the U.S. nuclear commitment to NATO allies.[1]

Completing the life extension program will likely cost more than $10 billion for all 400 nuclear bombs, or about $25 million per bomb.

[1] Jeffrey Lewis, "A Steal at $10 Billion," *Foreign Policy*, September 5, 2012, http://www.foreignpolicy.com/articles/2012/09/05/a_steal_at_10_billion?page=full

In these times of fiscal constraints, when funding for social programs and services that promote human security by helping feed and house the disenfranchised and the needy are being reduced, **it is morally unjustifiable to spend billions of dollars on nuclear weapons systems that we do not need.**

As members of the House Energy and Water Appropriations Subcommittee, you are in an important position to prevent these billions of dollars from being directed to these weapons systems. **Now, more so than ever, is the time for the United States government to re-evaluate how its spending reflects its priorities, and we urge you to reject funding for the B61 nuclear bomb.**

Thank you for your consideration.

Sincerely,

Carol Blythe, President
Alliance of Baptists

Shan Cretin, General Secretary
American Friends Service Committee

Nathan Hosler, Coordinator, Office of Public Witness
Church of the Brethren

Eli S. McCarthy, PhD, Justice and Peace Director
Conference of Major Superiors of Men

Rev. Dr. Ken Brooker Langston, Executive Director
Disciples Center for Public Witness

Rev. Dr. Jack Sullivan, Jr., President
Disciples Justice Action Network

Rev. Dr. Craig Watts, Chair
Disciples Peace Fellowship

Alexander D. Baumgarten, Director of Government Relations
Episcopal Church

Mary Minette, Interim Director for Advocacy
Evangelical Lutheran Church in America

Patrick Carolan, Executive Director
Franciscan Action Network

Diane Randall, Executive Secretary
Friends Committee on National Legislation (Quakers)

Dr. Sayyid M. Syeed, National Director
Islamic Society of North America

Ann Scholz, SSND, Associate Director for Social Mission
Leadership Conference of Women Religious

Kathy McNeely, Director
Maryknoll Office for Global Concerns

Rachelle Lyndaker Schlabach, Director
Mennonite Central Committee, U.S. Washington Office

Cassandra Carmichael, Director, Washington Office
National Council of Churches

Simone Campbell, SSS, Executive Director
NETWORK, A National Catholic Social Justice Lobby

Peter Vander Meulen, Director
Office of Social Justice of the Christian Reformed Church

Sr. Patricia Chappell, Executive Director
Pax Christ USA

Rev. J. Herbert Nelson, Director, Washington Office
Presbyterian Church (U.S.A.)

Jean Stokan, Director, Institute Justice Team
Sisters of Mercy of the Americas

Sandy Sorensen, Director, Washington Office
United Church of Christ, Justice and Witness Ministries

Jim Winkler, General Secretary
United Methodist Church, General Board of Church & Society

Taquiena Boston, Director, Multicultural Growth & Witness
Unitarian Universalist Association

Kathrin Vogler
Mitglied des Deutschen Bundestages

Kathrin Vogler, MdB, Platz der Republik 1, 11011 Berlin

Rep. Mike Rogers, Chairman
House Armed Services Subcommittee on
Strategic Forces
2120 Rayburn House Office Building
Washington, DC 20515

Berlin, 7. Oktober 2013

Kathrin Vogler, MdB
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Stellv. Vorsitzende des
Gesundheitsausschusses

Obfrau im Unterausschuss
„Zivile Krisenprävention und
vernetzte Sicherheit"

Stellv. Mitglied im
Verteidigungsausschuss

House Armed Services Subcommittee on Strategic Forces hearing on the proposal to upgrade B61 bombs

Dear Mr Rogers,

as a member of the Bundestag, the German parliament, I take the opportunity to address you in a matter of the highest importance for both our countries and the world.

As I have heard there will be a House Armed Services Subcommittee on Strategic Forces hearing in the U.S. Congress on October 10 on the proposal to upgrade the B61 bombs based in NATO countries.

Please let me inform you that the overwhelming majority of the German people oppose nuclear weapons. The modernization of nuclear bombs is not just a technical issue, this plan will lead to a new generation of nuclear weapons.

Contrary to this plan it is of the utmost importance to strive for a world free from nuclear weapons by means of an international convention that bans nuclear weapons. Thus the world could be freed of a

Kathrin Vogler
Mitglied des Deutschen Bundestages

whole type of weapons of mass destruction, like it was achieved with the Chemical Weapons Convention.

This issue is of the highest importance to the people in Germany, because B61 bombs are stationed in Germany at the Büchel Airbase in the federal state of Rhineland-Palatinate. In my opinion the withdrawal of these bombs ought to be the first step to be taken towards a nuclear free world.

It is not only for security reasons that nuclear disarmament is so urgent right now. The waste of financial resources that goes with the modernization of these bombs is unjustifiable in a world, where there is a desperate cry for more spending for people's needs, e. g. in health systems or for education.

Please let me express my hope that you will consider these thoughts in the hearing.

Yours sincerely,

Kathrin Vogler, MP

SENAAT

SENATOR
FRACTIEVOORZITTER
BERT ANCIAUX

Brussels, 16th October 2013

Rep. Mike Rogers, Chairman
House Armed Services Subcommittee on Strategic Forces
2120 Rayburn House Office Building
Washington, DC 20515

Dear Mr. Rogers,

We noticed that the B61 Life Extension Program and Future Stockpile Strategy is the subject of a hearing in the House Armed Services Subcommittee on Strategic Forces.
This modernization of the B61 nuclear weapon is sometimes presented as needed to fulfill the US obligations towards its European allies and their expectations towards the US extended deterrence. As a member of the Belgian Senate I would like to put into question this presentation of the opinions concerning the US extended deterrence in Europe.

In its Strategic Concept NATO consideres that *"the circumstances in which any use of nuclear weapons might have to be contemplated are extremely remote"*. It is significant that the statement that *"nuclear forces based in Europe and committed to NATO provide an essential political and military link between the European and the North American members of the Alliance"*, included in the 1999 NATO Strategic Concept, was omitted in the new Strategic Concept.

I consider further deployment of B61 nuclear weapons as of no military value. All deterrence roles considered for the B61 tactical nuclear weapon in the actual circumstances can be accomplished by conventional military means.
The modernization and further deployment of the B61 is a waste of resources for both the US and Belgian air force.

The remaining B61 weapons are also presented as bargaining tool for the much larger amount of Russian nuclear weapons. In our opinion the continuing deployment of the B61 rather gives Russia an excuse to keep its tactical nuclear weapons deployed. Bold nuclear disarmament steps will be more important incentives to bring Russia to the negotiation table than keeping B61's in Europe.

In Belgium there is a growing cross-party political consensus that the deployment of B61 nuclear weapons would best be ended. This opinion was expressed in resolutions of the Belgian Senate of 21 April 2005 and the Belgian Chambre of 13 July 2005, and was confirmed in several later resolutions like the Senate resolution of 29 January 2009.

In a 19 February 2010 op-ed, former prime ministers Guy Verhofstadt and Jean-Luc Dehaene, former minister of Foreign Affairs Louis Michel and former NATO Secretary General Willy Claes expressed their support for the withdrawal of US nuclear weapons. I fully support their statement: *"Ideally this [the withdrawal of US nuclear weapons from Europe] would take place in negotiation with Russia, to achieve a proportional reduction of Russian nuclear weapons. But sometimes we must dare to set an example and hope that it will be an inspiration to others."*

Fully respecting the autonomy of your decision making on this issue, I hope with this letter to have aided you in making an informed decision.

Yours sincerely,

Bert Anciaux
Senator and Leader of the Sp.a fraction in the Belgian Senate

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Thursday, 17th october, Brussel

Rep. Mike Rogers, Chairman
House Armed Services Subcommittee on Strategic Forces
2120 Rayburn House Office Building
Washington, DC 20515

Dear Mr. Rogers,

We noticed that the B61 Life Extension Program and Future Stockpile Strategy is the subject of a hearing in the House Armed Services Subcommittee on Strategic Forces.

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In its Strategic Concept NATO considers that "the circumstances in which any use of nuclear weapons might have to be contemplated are extremely remote." It is significant that the statement that "nuclear forces based in Europe and committed to NATO provide an essential political and military link between the European and the North American members of the Alliance", included in the 1999 NATO Strategic Concept, was omitted in the new Strategic Concept.

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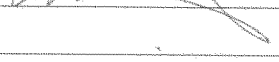
Fully respecting the autonomy of your decision making on this issue, I hope with this letter to have aided you in making an informed decision.

Yours sincerely,

Karin Temmerman	
Ann Vanheste	
Roxaline Nouton	
Bonte Dam	
GEERTS DAVID	
Nick Van Der Maelen	
Caroline Gennez	
Peter Vanvelthoven	
Meryame Kitir	
Bruno Tobback	

VLAAMS PARLEMENT

Ward Kennes
VLAAMS
VOLKSVERTEGENWOORDIGER

Brussels, October 24th

Rep. Mike Rogers, Chairman
House Armed Services Subcommittee on Strategic Forces
2120 Rayburn House Office Building
Washington, DC 20515

Dear Mr. Rogers,

We noticed that the B61 Life Extension Program and Future Stockpile Strategy is the subject of a hearing in the House Armed Services Subcommittee on Strategic Forces.

This modernization of the B61 nuclear weapon is sometimes presented as needed to fulfill the US obligations towards its European allies and their expectations towards the US extended deterrence. As a member of the Flemish Parliament I would like to put into question this presentation of the opinions concerning the US extended deterrence in Europe.

In its Strategic Concept NATO consideres that *"the circumstances in which any use of nuclear weapons might have to be contemplated are extremely remote."* It is significant that the statement that *"nuclear forces based in Europe and committed to NATO provide an essential political and military link between the European and the North American members of the Alliance"*, included in the 1999 NATO Strategic Concept, was omitted in the new Strategic Concept.

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In Belgium there is a growing cross-party political consensus that the deployment of B61 nuclear weapons would best be ended. This opinion was expressed in resolutions of the Belgian Senate of 21 April 2005 and the Belgian Chambre of 13 July 2005, and was confirmed in several later resolutions like the Senate resolution of 29 January 2009.

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Fully respecting the autonomy of your decision making on this issue, I hope with this letter to have aided you in making an informed decision.

Yours sincerely,

Ward Kennes

Wouter DE VRIENDT
FEDERAAL VOLKSVERTEGENWOORDIGER
GEMEENTERAADSLID OOSTENDE

Brussels, 16th of October 2013

Rep. Mike Rogers, Chairman
House Armed Services Subcommittee on Strategic Forces
2120 Rayburn House Office Building
Washington, DC 20515

Dear Mr. Rogers,

We noticed that the B61 Life Extension Program and Future Stockpile Strategy is the subject of a hearing in the House Armed Services Subcommittee on Strategic Forces.

This modernization of the B61 nuclear weapon is sometimes presented as needed to fulfill the US obligations towards its European allies and their expectations towards the US extended deterrence. As **Chair of the Military Acquisition Committee and Member of the Defence committee of the Belgian House of Representatives,** I would like to put into question this presentation of the opinions concerning the US extended deterrence in Europe.

At the NATO Summit in Lisbon in 2014, NATO should agree to a withdrawal of B61 nuclear weapons from Belgian territory by 2016. We propose to start bilateral talks between our two nations to prepare the withdrawal. Should the Lisbon Summit fail to reach a consensus in favour of their removal, we shall ask our government to achieve their removal by 2016 through direct bilateral discussions with your government.

In its Strategic Concept NATO considers that *"the circumstances in which any use of nuclear weapons might have to be contemplated are extremely remote."* It is significant that the statement that *"nuclear forces based in Europe and committed to NATO provide an essential political and military link between the European and the North American members of the Alliance"*, included in the 1999 NATO Strategic Concept, was omitted in the new Strategic Concept.

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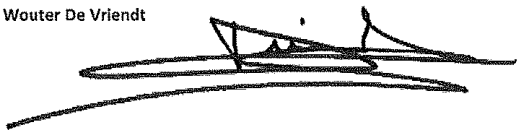
Fully respecting the autonomy of your decision making on this issue, I hope with this letter to have aided you in making an informed decision.

Yours sincerely,

Wouter De Vriendt



Member of Parliament

Groen

MICHAEL R. TURNER
TENTH DISTRICT, OHIO

COMMITTEE ON ARMED SERVICES
CHAIRMAN
SUBCOMMITTEE ON
TACTICAL AIR AND LAND FORCES

COMMITTEE ON OVERSIGHT AND
GOVERNMENT REFORM

ASSISTANT MAJORITY WHIP

Congress of the United States
House of Representatives
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August 16, 2013

R.W. Knops M.A.
Member of Parliament
Chairman of the Committee on European Affairs
Plein 2
2511 CR The Hague
P.O. Box 30805
2500 GV The Hague
The Netherlands

Dear Raymond,

Thank you for your letter of July 10. I have greatly valued our friendship, and I am always eager to ensure full and open dialogue between the United States and our close partners and allies. I appreciated the opportunity to better understand the concerns expressed by members of your Parliament in recent debates regarding the extended nuclear deterrent the U.S. provides to NATO, and I wanted to provide you the perspective from the United States Congress.

As you know, NATO has made clear and consensus decisions in recent years to remain a nuclear alliance and retain U.S. nuclear weapons in Europe. For instance, the recent NATO Deterrence and Defence Posture Review (DDPR) states, "[n]uclear weapons are a core component of NATO's overall capabilities for deterrence and defence alongside conventional and missile defence forces," and that, "[a]s long as nuclear weapons exist, NATO will remain a nuclear alliance." This was, of course, only the latest of the many recent re-affirmations of this NATO policy.

Alongside these policy decisions by the Allies, the U.S. again reaffirmed its commitment to providing forward-deployed nuclear weapons to the Alliance that are safe, secure, reliable, and credible as a deterrent against potential aggression, including in President Obama's 2010 Nuclear Posture Review and his recent issuance of a new nuclear weapons employment guidance in June.

The B61 nuclear gravity bomb is the cornerstone of U.S. extended deterrence to NATO (as well as to allies in Asia) and—simply put—must be modernized within the next decade to ensure it remains safe, secure, reliable, and credible.

While the decision to have nuclear weapons in Europe is a NATO Alliance decision, the decision to modernize the B61 is a U.S. decision—and the costs for the updated weapon are paid by U.S. taxpayers. As your letter highlights, this cost is significant, but it is manageable spread across the approximately 13 years of the program.

However, the B61 also plays a critical role in the United States' *strategic* deterrent, not just the extended deterrent we provide to allies in Europe and East Asia. In addition to fighter-bombers supplied by NATO and the U.S., the B61 is also deployed by U.S. B-2 strategic bombers and plays a key role in the nuclear force triad the U.S. needs for its own security. That is why attempts to limit funding or the scope of the modernization have been defeated when considered by the House of Representatives this year.

As a member of the House Armed Services Committee, which authorizes programs and funding for the U.S. military, I have paid close attention to the ongoing B61 Life Extension Program (LEP) and the discussions we have with our allies about our extended deterrent.

I believe that the U.S. and all NATO member states must stand by the decisions of the Alliance, including in the DDPR. Allies that make individual decisions that don't reflect Alliance policy risk undermining the very principles of burden-sharing and mutual defense that have made the Alliance so successful.

Officials from several NATO members have expressed grave concern to me about their security should U.S. nuclear weapons be removed from Europe. It is incumbent upon each NATO member state that supported the consensus policy statements in the Strategic Concept and DDPR to follow through and support the security of all of the states in the Alliance by supporting its decision to remain a nuclear alliance, "as long as nuclear weapons exist". I commend all host nations for supporting the Alliance in this very important way and further thank those who provide funding and personnel for security forces and dual-capable aircraft.

I also believe it would be irresponsible to simply walk away from the modernization of this warhead in view of the robust nuclear modernization programs of the Russian Federation. Whether or not we like it, Russia views the West as a threat, and it is unlikely to cease its nuclear deterrent modernization just because we decide not to invest in our own programs. Moreover, it would send precisely the wrong signal to unilaterally disarm ourselves – which is what the cancellation of the B61 LEP would amount to – when NATO has stated, by consensus, that reductions in its forces would have to be taken through reciprocal action with Russia. There can be no doubt that Vladimir Putin's Russia does not respect the good intentions of the nuclear disarmament movement.

For example, it is unclear how much longer Russia will consider itself bound by the Intermediate Range Nuclear Forces agreement. When President Putin makes statements like he did this past June that the decision by the then-Union of Soviet Socialist Republics to ratify the Intermediate Range Nuclear Forces Treaty was "disputable" there is a clear impression that he is

not committed to this landmark agreement. NATO cannot want to be without the U.S. extended deterrent if Russia decides to walk away from the INF treaty, as Putin's comments presages.

Once again, thank you for your letter. I look forward to our next meeting and to continued cooperation and friendship between us and our countries.

Sincerely,

Michael R. Turner
Member of Congress

WITNESS RESPONSES TO QUESTIONS ASKED DURING THE HEARING

OCTOBER 29, 2013

RESPONSES TO QUESTIONS SUBMITTED BY MR. GARAMENDI

General KEHLER. That is mainly correct. As it stands today, the B83 is not compatible with the F–35 or any other dual-capable fighter aircraft. The F–35 is being fielded as a survivable platform with a modern, digital-only weapon control system. To make the B83 work on the F–35 would require significant and extensive modifications to the weapon, the supporting infrastructure and perhaps the platform itself, all at a much higher cost than the planned B61 program. For example, the B83 would require a complete replacement of its outdated analog technology as well as an overhaul of its security features. Such a full scope, nuclear and non-nuclear re-design would require extensive testing and certification before deploying on the F–35. Finally, all overseas storage vaults and maintenance equipment would need modification to support the B83. [See page 14.]

General KEHLER. The B83 can be delivered by the B–2 and B–52. It is not certified for delivery on any other current aircraft. [See page 15.]

Dr. COOK. The B61–12 LEP with guided tail kit assembly will replace four of the five current variants of the B61, resulting in a single variant after the B61–11 is retired. U.S. Strategic Command determined that with the accuracy provided by a tail kit, the yield provided by today's lowest yield B61 variant would be sufficient to meet all of the strategic and non-strategic requirements for gravity systems. Having a single variant will enable a reduction in the number of deployed and non-deployed air-delivered nuclear gravity weapons in the stockpile, while increasing the safety and security of this aging system. Additionally, by balancing reduced yield with improved accuracy, this LEP would allow us to pursue retirement of the B61–11, and the B83 gravity bomb, once confidence in the B61–12 stockpile is gained; as provided in the FY 2014 NNSA Stockpile Stewardship and Management Plan. All of these aspects above allow the majority of the air delivered gravity weapons to be removed from the U.S. nuclear stockpile (active and inactive), a very large reduction in the total amount of nuclear material utilized by air delivered gravity weapons in the U.S. nuclear stockpile, and a significant reduction in the total nuclear yield (i.e., mega-tonnage) produced by air-delivered gravity weapons in the U.S. nuclear stockpile. Additionally, information can be provided in a classified forum upon request. [See page 25.]

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

OCTOBER 29, 2013

QUESTIONS SUBMITTED BY MR. ROGERS

Mr. ROGERS. Secretary Creedon, you are the U.S. representative to NATO's High Level Group, which discusses nuclear weapons aspects of NATO defense posture. What are the consequences to NATO and our relationship with our NATO allies if we fail to deliver on the B61 Life Extension Program (LEP)?

a. We've heard some people say that NATO should pay for part of the B61 LEP. Does the Administration think it is appropriate for a foreign country to pay for sustainment of U.S. nuclear weapons? Would that violate any treaties? Does it violate common sense?

b. Do you anticipate NATO changing its policy on nuclear weapons any time soon?

Secretary CREEDON. a. NATO contributes to the Alliance's nuclear posture in two ways. First, through the NATO Security Investment Program, NATO allies provide funding for security and infrastructure enhancements and upgrades at European nuclear weapons storage sites. Second, NATO allies burden-share in the nuclear mission by assigning pilots and dual-capable aircraft to the mission, and by supporting the nuclear mission with conventional operations (such as the SNOWCAT program—"Support of Nuclear Operations with Conventional Air Tactics"). I do not think it is appropriate for a foreign country to pay for sustainment of U.S. nuclear weapons because it would subject classified U.S. nuclear data to be disclosed to foreign nations and will open contributing nations to charges of proliferation. Moreover, these are U.S. weapons and the U.S. must remain responsible for their sustainment.

b. The 2012 Deterrence and Defense Posture Review concluded that nuclear weapons are a core component of NATO's overall capabilities for deterrence and defense, alongside conventional and missile defense forces; and that the Alliance's nuclear force posture currently meets the criteria for an effective deterrence and defense posture. Moreover, the DDPR states that, as long as nuclear weapons exist, NATO will remain a nuclear Alliance. Since the security environment since 2012 has not changed appreciably, I do not anticipate NATO changing its policy on nuclear weapons in the foreseeable future.

Mr. ROGERS. What is our non-NATO allies' interest in the B61 LEP?

a. What do you foresee as potential impacts on some of our Asian allies, in particular Japan and South Korea, if we fail to execute the LEP?

b. Wouldn't we be endangering the credibility of our extended deterrent if the B61 LEP isn't funded?

Secretary CREEDON. The B61 plays a critical role in the U.S. nuclear posture in East Asia because it serves both as an assurance and deterrence function for Japan and South Korea. The B61 assures our allies by providing them with a tangible demonstration of the seriousness of the U.S. extended deterrence commitment.

Mr. ROGERS. Do you believe our extended deterrent assurances to allies lose credibility if we continue to slip deadlines for modernizing our stockpile?

Secretary CREEDON. In the 2010 Nuclear Posture Review report, the Administration stated that it was committed to the full scope life extension of the B61. Both the Administration's 2013 nuclear employment guidance and the North Atlantic Treaty Organization's 2012 Deterrence and Defense Posture Review rely, in part, on this commitment. The U.S. nuclear employment guidance states that the United States will maintain the capability to forward-deploy non-strategic nuclear weapons (i.e., the B61) with heavy bombers and dual-capable aircraft in support of extended deterrence and assurance of U.S. allies and partners. Similarly, as the only U.S. nuclear weapon assigned to NATO, the B61 supports the Alliance's commitment in the DDPR that NATO will remain a nuclear alliance for as long as nuclear weapons exist and to maintain the current nuclear posture. Based on these commitments, it is critical that the United States complete the B61 LEP as scheduled.

Mr. ROGERS. If we decided tomorrow to withdraw all B61s forward-deployed in support of NATO, would we still need to execute the B61 LEP?

a. Is the need for the B61 LEP driven by our NATO Alliance commitments, or by our own nuclear deterrent needs?

Secretary CREEDON. Both the 2010 Nuclear Posture Review and the June 2013 U.S. nuclear employment guidance state that the United States will maintain a nu-

clear Triad consisting of intercontinental ballistic missiles, submarine-launched ballistic missiles, and nuclear capable bombers—including heavy bombers and dual-capable aircraft. Further, this guidance states that the United States will retain the capability to forward deploy non-strategic nuclear weapons (NSNW), like the B61. Additionally, as a result of the retirement of the B83, the B61 will be the only gravity weapon to support the B–2 mission. Retaining all three legs of the Triad best maintains strategic stability at reasonable cost while hedging against potential technical problems or vulnerabilities. To maintain an effective and credible Triad—which includes the ability to forward deploy NSNW—the B61 LEP is necessary whether or not it remains a component of NATO's deterrence and defense posture.

Finally, benefits of the B61–12 LEP are not limited to commitments to NATO. The technical work performed for this LEP will be leveraged for future LEPs, providing potential cost savings to other programs.

Mr. ROGERS. We have heard from various disarmament advocates that the B61 LEP is premised on a number of assumptions that may be outdated. This includes an assumption that the U.S. will continue to forward-deploy B61s in Europe, even though President Obama has stated his desire to negotiate with Russia to remove these weapons. Also, President Obama has said he believes we can reduce the number of nuclear weapons further, so maybe we just don't need the B61 going forward. So, do you think deterrence requirements are changing, and therefore we should reexamine the scope of the B61 LEP or its existence altogether?

Secretary CREEDON. The role of U.S. non-strategic nuclear weapons (NSNW) in Europe was recently re-evaluated by the NATO Alliance in May 2012 as part Deterrence and Defence Posture Review (DDPR). As part of the DDPR all NATO members agreed that "Nuclear weapons are a core component of NATO's overall capabilities for deterrence and defence alongside conventional and missile defence forces"; that "As long as nuclear weapons exist, NATO will remain a nuclear alliance"; and "While seeking to create the conditions and considering options for further reductions of non-strategic nuclear weapons assigned to NATO, Allies concerned will ensure that all components of NATO's nuclear deterrent remain safe, secure, and effective for as long as NATO remains a nuclear alliance."

The President has stated his desire to further reduce the amount and role of nuclear weapons and the B61–12 LEP is an important step towards achieving those objectives. Once the B61–12 LEP program is completed and confidence in its capabilities are established the U.S. will be able to reduce the number of nuclear gravity bombs by over 50 percent and the amount of nuclear material utilized in those gravity bombs by over 80 percent. The B61–12 LEP is a key component of the Administration's requirement that the U.S. retain the capability to forward deploy nuclear weapons on tactical fighters and heavy bombers, most recently expressed in the revised nuclear employment guidance in June 2013 and also in the Nuclear Posture Review in 2010.

Mr. ROGERS. a. NNSA's final cost estimate for the B61–12 LEP came in at around $8 billion. I understand that DOD's CAPE office has put forward an estimate of over $10 billion. Please describe the level of rigor and effort that went into developing this estimate.

Dr. COOK. a. NNSA used a high level of rigor and effort to develop the B61–12 cost estimate. The current cost estimate for the B61–12 life extension program (LEP) reported in the September 2013 Selected Acquisition Report to Congress is $8.1B which includes $7.3B in direct B61–12 funding and another $0.8B in other NNSA funds. The estimate is based on the Weapon Design and Cost Report (WDCR) published in July 2012 and has not changed with the exception of the impacts due to the FY 2013 sequestration cuts.[1] NNSA submits quarterly updates to Congress on cost and schedule and will formally update the cost estimate following the Baseline Design Review to establish an Acquisition Program Baseline in FY 2016. The WDCR cost estimate is the initial cost estimate for the weapon program. NNSA used a bottom-up cost estimating approach involving more than 40 product realization teams with representatives from each of the NNSA design and production agencies. The WDCR cost estimate followed the GAO cost estimating guidance using three-point estimates, risk based contingency analysis, and included management reserve. Component level costs are directly linked to the life extension option and comprise both direct costs associated with design, development, procurement, and testing as well as system level integration and testing costs. The estimate was inter-

[1] As a result of sequestration, NNSA slipped the First Production Unit (FPU) from September 2019 to March 2020 and added $244M to the management reserve to offset the potential increased costs and associated risks with delaying the program by six months. The first B61–12 Selected Acquisition Report to Congress, which formally documents weapon program cost and schedule, included the sequestration impacts.

nally, but independently, reviewed and represents a formal commitment by each site on expected costs for the weapon program. The estimate will be updated in the Baseline Cost Report following completion of the Baseline Design Review and prior to entry into Phase 6.4 in FY 2016.

Mr. ROGERS. b. Would you please describe how CAPE arrived at this number?

Dr. COOK. b. The DOD CAPE developed their cost estimate independently. NNSA must defer to the DOD to answer questions on the process they used. One major difference between the CAPE estimate and that provided by the NNSA WDCR was an extended schedule. CAPE assumed an additional three years of development work.

Mr. ROGERS. c. What is your professional opinion of this number by CAPE?

Dr. COOK. c. CAPE developed their cost estimate independently. Therefore, NNSA cannot offer an opinion.

Mr. ROGERS. d. Which number do you stand by?

Dr. COOK. d. The NNSA stands by the $8.1 billion cost estimate published in the September 2013 Selected Acquisition Report.

Mr. ROGERS. a. What are the impacts to the B61 LEP if sequestration is allowed to continue for the duration of FY14?

Dr. COOK. a. The impact of additional sequestration cuts to the program schedule is being assessed but is expected to be less than 3 months to the March 2020 first production unit (FPU). If funding for the B61–12 and related activities is restored to the President's Budget Request (PBR) level, the LEP would be able to maintain its current March 2020 FPU commitment reported in the September 2013 Selected Acquisition Report (SAR). Funding at the $537M PBR level versus the $561M B61–12 SAR estimated requirement will increase risk to the FPU as less funds will be available for risk mitigation. In addition, funding for NNSA infrastructure investments is also limited. This could cause system- or facility-level failures in the nuclear security enterprise that would preclude safe and secure operations, causing unplanned delays in the B61 LEP and other programs.

Mr. ROGERS. b. If a continuing resolution is passed for much of FY14, what are the effects if the B61 LEP does not receive an "anomaly" that enables it to spend at the level of the President's budget request?

Dr. COOK. b. Under the current CR, the B61–12 is being held to $369M as opposed to the PBR of $537M or the Selected Acquisition Report estimated requirement of $561M. If the program is held at the $369M level through FY 2014, it would significantly impact NNSA's ability to meet the B61–12 LEP FPU date. The reduced funding would require a reduction in the current B61–12 technical staff levels, elimination of development hardware procurements, and cancellation of joint test activities with the USAF. The lack of new hardware also impacts component development activities and testing for FY 2015. The FPU in March 2020 could not be achieved and could possibly slip into FY 2021.

Mr. ROGERS. As the principal design agent for this LEP, Sandia did the bulk of the work that led to the final cost estimate of around $8 billion. Please describe the level of rigor and effort that went into developing this estimate. I understand that DOD's CAPE office has put forward an estimate of over $10 billion. Would you please describe how CAPE arrived at this number? What is your professional opinion of this number by CAPE? Which number do you stand by?

Dr. HOMMERT. When NNSA provided to Congress the B61–12 Weapon Design and Cost Report (WDCR), the overall estimate of approximately $8 billion over 12 years for the full program included the production and deployment of the required number of nuclear bombs. Within that cost estimate, Sandia's portion is $2.65 (note, this is the design agency cost) billion estimated total incremental cost for work on the B61 LEP specified in the WDCR.

The rigor of this estimate met my expectation for capturing the uncertainty and risks associated with a program in the conceptual design phase. This estimated cost includes an appropriate amount of risk informed contingency. Sandia's estimate includes a task based estimate of cost for each major component and sub-systems in the life extension program and was developed by our nuclear weapons experts. A high level of confidence in the cost estimate was achieved through close coordination with both NNSA and DOD staff, resulting in a mature understanding of negotiated threshold and programmatic requirements. We also complied with NNSA direction to utilize the Government Accountability Office standards for cost estimating. Sandia conducted internal management and independent reviews of our estimate before forwarding it to NNSA. Our review process also included external experts who concluded that SNL's estimate met the NNSA-directed WDCR criterion that the estimate be accurate, repeatable, auditable, and defensible.

CAPE completed a program risk assessment of the entire NNSA B61–12 WDCR rather than a detailed independent cost estimate. CAPE's review was requested by

NNSA. The WDCR is the only definitive cost estimate. The primary driver for the differential in CAPE's assessment was reducing Sandia's schedule overlap for the B61–12 which meets the Nuclear Weapon Council's requirement to complete weapon first production in fiscal year 2019. CAPE also used a different cost assumption for its labor rates for its assessment instead of utilizing the NNSA labor rates in the WDCR.

With respect to technical risk, I have the highest level of confidence that technical issues will NOT cause impact to Sandia's schedule performance, as we demonstrated through progress in FY13. I say this for two reasons. First, we do not view this program as inherently high technical risk, especially when compared with other product development programs conducted at Sandia. Second, we manage our contingency funds (~10%) in a manner that continuously buys down risk against a formalized risk register. Our FY13 and FY14 labor rates were at or below the labor rates included in the WDCR.

With respect to budgetary changes, FY13 sequestration impacts caused some technical activities to be moved into FY14. We estimated the schedule impact of those shifts to be relatively small—on the order of 2 to 3 months over the life of the program (within overall schedule contingency). However, at the time of this testimony, we are operating against a FY14 resource allocation that, on an annual basis, is at least 23% below the FY14 requirement, as contained in the most recent NNSA-approved Baseline Change Requests to the Selected Acquisition Report, approved in October 2013. Obviously, unless addressed, budgetary changes of this magnitude will have significant schedule impact. As with any large program activity, schedule slip will result in an increase in overall program cost.

As noted, CAPE completed a risk assessment of the entire NNSA B61–12 estimate rather than a detailed independent cost estimate. The CAPE team, working collaboratively with NNSA and Sandia, acted within the severe time constraints assigned to it by the Nuclear Weapons Council to complete the risk assessment and the unique characteristics of a nuclear weapon program which operates differently than conventional Defense Department acquisition process. Sandia benefited from the CAPE engagement and their review. We share their goal of wisely and appropriately managing the program to the WDCR estimate to meet the schedule and expected labor rates. The major drivers leading to a significant difference in the CAPE prediction from the SNL estimate are consistent as previously explained. If these drivers are experienced, cost will increase.

Sandia National Laboratories made a commitment to deliver the B61–12 to the estimate provided to NNSA as our portion of the Weapon Design and Cost Report (WDCR) which included contingency funding, and leveraging other NNSA programs The Laboratories continue to stand by that estimate. Assuming all the WDCR obligations are met, including contingency and NNSA programs supporting the B61–12, I expect to continue to meet the commitments. At the time of my testimony, we had costed $253 million of the $2.65 billion. Against those expenditures, we have met all major milestones on (or under) cost. These milestones include system-level mechanical environment tests, radar flight performance tests, and functional electrical compatibility tests.

QUESTIONS SUBMITTED BY MR. COOPER

Mr. COOPER. Are there expected cost-savings from doing the B61–12?

Secretary CREEDON. Yes. The B61–12 will become the only gravity-dropped nuclear weapon in the U.S. nuclear stockpile. It will fulfill both the strategic and non-strategic requirements of the airborne component of the U.S. nuclear Triad. It will allow the retirement or consolidation of six different types of nuclear gravity weapons that are currently maintained in the U.S. nuclear stockpile significantly reducing the costs associated with stockpile, surveillance and testing, and eliminating the need to perform additional, costly life-extension programs (LEP) for these weapons that would otherwise be required within the next decade. Without the B61–12 LEP these cost savings cannot be realized.

Mr. COOPER. What drives the requirement of approximately 500 B61s? What dries the requirement for the number of forward-deployed B61s? Has the Administration considered performing a LEP on a lower number of B61s?

Secretary CREEDON. The requirements for the numbers and types of weapons in the stockpile come from the recommendations of Commander, U.S. Strategic Command, and the Chairman of the Joint Chiefs of Staff. Their recommendations reflect the amount and types of weapons needed to defend our nation and our Allies, and to deter other nations that might use or threaten to use nuclear weapons against

the United States or our Allies. Roughly 80 percent of the cost of the B61–12 LEP is needed to produce the first weapon and the remaining 20 percent of the costs are associated with the follow-on weapons produced. As such, any reduction in the number of B61–12s produced would result in very little cost savings. The current number of B61–12s planned still allows for a more than 50 percent reduction in the total number of nuclear gravity bombs in the U.S. nuclear stockpile and a more than 80 percent reduction in the total amount of nuclear material contained within those remaining bombs.

Mr. COOPER. Are you confident that NNSA can manage a workload which includes 4–5 concurrent life extension programs?

Secretary CREEDON. We are confident that NNSA can manage the current scope of work required to meet long-term requirements. Concurrency of work remains a concern, and therefore our plan is structured not to exceed the capacity of NNSA facilities by sequencing programs and by utilizing reuse of components where possible to minimize both costs and infrastructure utilization.

Mr. COOPER. The administration has pledged that it would not develop new capabilities. Specifically on the B61, the lower yield is being compensated by higher accuracy provided by a new tailkit. However, if you now have approximately 500 B61–12s which could theoretically all be used as strategic assets, would this provide new capability?

Secretary CREEDON. The B61–12 tail-kit assembly (TKA) does not provide a new capability to the weapon. The TKA simply improves the reliability of the bomb. This improved reliability permits us to utilize a design with a lower maximum yield, one that is already in the active stockpile, to address both strategic and non-strategic targets.

Mr. COOPER. What is status on the plans for the three interoperable warheads?

Secretary CREEDON. The interoperable warheads are still an essential element of the long-term modernization strategy for the nuclear deterrent. Current fiscal constraints are causing us to consider delaying the development of the first interoperable warhead. Even though there may be a delay in obtaining these warheads, the plan is still to pursue an interoperable warhead capability.

Mr. COOPER. Is there a risk that new interoperable warheads planned under the 3+2 plan will increase the likelihood that the United States might need to return to testing? What is the risk of having 3 new (and unproven) interoperable warheads account for most of the U.S. stockpile?

Secretary CREEDON. We have a suite of computational and experimental tools that we currently use to certify the stockpile, and those tools would be used to certify the interoperable designs. We see no increased risk in the interoperable designs because we plan to reuse current design and underground-tested assets.

Mr. COOPER. Could the Long-Range Stand Off (LRSO) cruise missile and warhead be carried on the F–35?

Secretary CREEDON. We conducted an abbreviated review of this option and determined that it is both technically infeasible and impractical. We could physically attach the missile with the warhead onto the F–35 aircraft if we made a shorter version of the missile. The missile would have to be carried externally and would cause the F–35 to lose all stealth capability, greatly diminishing aircraft survivability and the probability of successful weapon delivery.

Using LRSO in place of a B61–12 would create significant treaty compliance, Alliance, and infrastructure issues.

Mr. COOPER. Are there expected cost-savings from doing the B61–12? [Question #16, for cross-reference.]

Dr. COOK. The cost of the B61–12 LEP versus an alternative strategy that maintains the current family of B61s and the B83 is estimated to be approximately half the cost in both the 25-year planning window as well as the 50-year planning window. The alternative strategy requires NNSA to maintain the current B61 Mod configurations and the B83–1 bombs to meet military requirements for U.S. strategic and extended nuclear deterrence missions. The cost for the alternative strategy includes two B61 alterations, a B83 alteration, and full LEPs for both bombs to ensure capability over the two planning windows assessed. There are additional benefits beyond cost savings enabled by the B61–12 LEP including:

- The majority of the air delivered gravity weapons will be removed from the U.S. nuclear stockpile (active and inactive).
- A very large reduction in the total amount of nuclear material utilized by air delivered gravity weapons in the U.S. nuclear stockpile.
- Significant reduction in the total nuclear yield (i.e., mega-tonnage) produced by air-delivered gravity weapons in the U.S. nuclear stockpile.

These planned reductions in the numbers of weapons, amounts of nuclear material, and total yield are dependent upon the successful completion of the B61–12

LEP. They are a key part of the Administration's long-term plan to demonstrate that we are making progress on our Non-Proliferation Treaty Article VI obligations.

Mr. COOPER. What is the updated cost difference between the B61 option 1E and B61 option 3B? [Question #17, for cross-reference.]

Dr. COOK. Switching to the B61 1E today is not a lower cost option. Because the B61–12 is in the second year of engineering development using the current requirements, making a dramatic change now would require major component redesign and a restart of most systems engineering. This would delay the program for 1 to 2 years. Further, NNSA's Defense Programs, Office of Program Integration completed a B61 Alternatives Analysis in FY 2013. The analysis considered the current mod consolidation strategy versus an alternative that would maintain the current family of B61s and the B83 without the B61–12 LEP. While the analysis did not specifically call out option 1E, sufficient similarities exist to make this comparison applicable. The analysis compares the costs to maintain the B61–12 versus the existing gravity bombs stockpile (B61 family and B83) over 25-year and 50-year planning windows. For the B61–12 LEP the analysis assumed a 20 year stockpile life and a second LEP is required in the 50 year planning window. For the existing bombs stockpile the analysis assumed non-nuclear alterations on the B61–3, B61–4, B61–7 and B83–1 would be performed prior to 2030 and full LEPs on both bomb families before 2040. This analysis demonstrated that the costs of the B61–12 LEP approach are approximately half as much as maintaining the existing bombs stockpile. The B61–12 LEP, as currently authorized by the Nuclear Weapons Council and requested in the Administration's FY 2014 budget request, is the lowest cost option that meets military requirements. Any other alternative would not meet military requirements and would drive-up lifecycle costs for these modernization activities, which are necessary to realize the President's nuclear security vision.

Mr. COOPER. a. How did the government shutdown affect the schedule of the B61 Life Extension Program?

Dr. COOK. a. A combination of the government shutdown and the CR funding level is expected to result in a 3-month slip to the Baseline Design Review from FY 2015 to FY 2016. Further delays were mitigated through the use of carry-over funding. If funding is restored to the PBR level of $537M by January, the program would be able to maintain its current March 2020 FPU but at increased risk because funding is below B61–12 SAR estimated requirement of $561M. The reduced funding will result in less-than-planned program contingency to reduce risk. In addition, funding for NNSA infrastructure investments is also limited. This could cause system- or facility-level failures in the nuclear security enterprise that would preclude safe and secure operations, causing unplanned delays in the B61 LEP and other programs.

Mr. COOPER. b. Are any additional costs expected because of the shutdown?

Dr. COOK. b. While the CR funding level of $369M will have an impact as noted above, there are no additional costs attributed specifically to the shutdown.

Mr. COOPER. c. And what will the impacts be if sequester remains in FY14?

Dr. COOK. c. The impacts of additional sequestration cuts to the program is being assessed but is expected to be less than 3 months to the March 2020 FPU.

Mr. COOPER. What is the NNSA's current estimated total cost for the B61 Life Extension Program?

Dr. COOK. The current cost estimate for the B61–12 life extension program reported in the September 2013 Selected Acquisition Report to Congress is $8.1B, which includes $7.3B in direct B61–12 funding and another $0.8B in other NNSA funds. This estimate is based on the Weapons Design and Cost Report published in July 2012 and has not changed with the exception of the impacts due to FY 2013 sequestration cuts.

Mr. COOPER. a. Since NNSA B61 costs rose from $7.9 billion to $8.1 billion due to sequestration impacts, can we expect a similar cost increase (and further delay occur) if sequestration continues into FY14?

Dr. COOK. a. If sequestrations cuts extend the program, there will be an increase in the estimated total program cost. Current analysis indicates if the B61–12 receives funding at the President's Budget Request (PBR) versus the B61–12 Selected Acquisition Report (SAR) estimated requirement of $561M, the program would be able to maintain its current March 2020 first production unit, albeit at a higher risk. Funding below the request due to sequestration may result in an additional 1–3 month delay. Schedule assessment is underway along with the re-planning effort resulting for the 3 month CR at $369M. The analysis is also assessing how other programs that support the B61 12, such as the science and engineering campaigns, would also be affected by FY 2014 sequestration.

Mr. COOPER. b. Assuming no sequestration in FY14 and full funding, can you guarantee that the B61–12 will be delivered by FY 2020 for under $8.1 billion?

Dr. COOK. b. NNSA is confident we can meet a 2020 first production unit if the program is fully funded as defined in the B61–12 Selected Acquisition Report (SAR) in FY 2014 and subsequent years. NNSA has high confidence in the cost estimate developed in the B61–12 Weapons Design and Cost Report and reported in the B61–12 SAR. Our initial cost estimate was developed using sound principals, reasonable assumptions, and was independently verified. However, it is an initial estimate that NNSA will update in FY 2016 as part of the Baseline Cost Report prior to authorizing Phase 6.4 when the LEP design is approximately 90% complete and the program is beginning final design, pre-production, and system qualification activities. The estimate in the Baseline Cost Report will be the Acquisition Program Baseline. Currently the program is on schedule with the greatest risk being funding uncertainty and not technical challenges. This response also assumes that limited infrastructure funding does not result in any operational impacts due to safety or security concerns.

Mr. COOPER. c. What is the risk of delay or cost increase if NNSA does not receive full funding for the B61 not only in FY14 but in the next five years?

Dr. COOK. c. The risk of sequestration cuts over the next five years is unplanned cost growth by extending the development and production periods. This will also complicate maintaining schedule alignment with the USAF, potentially driving additional DOD costs as well. In Fiscal Year (FY) 2013 the impacts of sequestration reduced NNSA's total resources by 7.8 percent and stressed the nuclear enterprise's ability to support the long-term aspects of the "3+2" modernization strategy in order to try to protect its near-term commitments like the W76 LEP. Sequestration has already resulted in a roughly six-month delay to the first production unit of the B61–12 from 2019 to 2020. Without a solution to the current fiscal crisis in FY 2014 the DOD and DOE will be forced to make even more difficult decisions that could reduce the long term financial benefits of the "3+2" strategy. In addition, funding for NNSA infrastructure investments is also limited. This could cause system- or facility-level failures in the nuclear security enterprise that would preclude safe and secure operations, causing unplanned delays in the B61 LEP and other [Editor note: answer as sent was incomplete.]

Mr. COOPER. How does the cost per unit for the B61–LEP compare with previous LEP costs?

Dr. COOK. Cost per unit is dependent on the total production quantity, which is classified and available in the classified addenda of the B61–12 and W76–1 Selected Acquisition Reports. These unit costs are consistent between the programs in terms of the relative complexity and total production quantities.

Mr. COOPER. Do you agree with CAPE's conclusions that cost will reach $10.1 billion and schedule could slip to FY22?

Dr. COOK. I am confident that B61–12 FPU can be achieved by FY 2020 provided the program is fully funded at the SAR estimated requirement of $8.1B. Today, the greatest risk to holding schedule is annual budget uncertainty rather than technical risk. Our estimate for the program is $7.3B in direct B61–12 funding with an additional $0.8B leveraged from other NNSA science and engineering campaigns. This cost estimate has not changed, with the exception of sequestration impacts, from the original cost estimate in the B61–12 Weapon Design Cost Report published on July 25, 2012.

Mr. COOPER. What is status on the plans for the three interoperable warheads?

Dr. COOK. In November 2012, the Nuclear Weapons Council selected a baseline stockpile life extension plan that implements the "3+2" vision in which three interoperable warheads for ballistic missiles is an integral part. The baseline plan was detailed in a Nuclear Weapons Council memorandum dated January 15, 2013. The Nuclear Weapons Council plan establishes the framework to develop more detailed implementation plans for deployment of interoperable warheads. Over the coming months, NNSA and the Department of Defense will work together to continue to analyze cost, scope, schedule and other implications of this vision as means to inform future decisions regarding the nuclear weapons enterprise.

Mr. COOPER. The FY 2014 Stockpile Stewardship and Management Plan states that the "3+2" strategy is "an executable plan." However, given the costs of the interoperable warheads and budget constraints does NNSA still believe the "3+2" vision is still achievable?

Dr. COOK. Yes, we believe the vision is achievable, but it may require some modification and/or delay. NNSA is working with the Department of Defense, through the Nuclear Weapons Council, to analyze cost, scope, schedule and other implications of the current baseline plan as means to inform future decisions regarding the nuclear weapons enterprise. Among the factors the two departments are analyzing are affordability, feasibility, and synchronization with delivery platform modernization plans.

Mr. COOPER. a. Is there a risk that new interoperable warheads planned under the 3+2 plan will increase the likelihood that the United States might need to return to testing?

Dr. COOK. a. No. LEPs developed to enable interoperable warheads will not result in an increased likelihood of an underground test. On the contrary, all LEPs (past and future) are intended to reduce the likelihood of a need for a return to testing. By eliminating effects of aging and increasing performance margins, LEPs result in a stockpile that will continue to be safe, secure, and reliable without a need to return to testing. In particular, all of the design and manufacturing changes proposed for the W78/88–1 LEP are subject to intense peer review and evaluation by all three labs. The use of modern stockpile stewardship tools allows all LEP changes to be thoroughly vetted and understood through modeling and experiments without a need for nuclear explosive testing.

Mr. COOPER. b. What is the risk of having 3 new (and unproven) interoperable warheads account for most of the U.S. stockpile?

Dr. COOK. b. Certification of interoperable warheads will be based on simulations, experiments tied to previous underground tests (UGTs), and expert judgment. Improvements in simulations and experiments provide confidence that there will not be a need to return to UGTs.

Mr. COOPER. Do you agree with CAPE's conclusions that cost will reach $10.1 billion and schedule could slip to FY22?

Dr. HOMMERT. There has been considerable discussion about schedule slip or cost growth on the B61 LEP. With respect to this topic, I can only address Sandia's role; however, as the predominant design agent for the LEP, we recognize the impact of our work on the overall enterprise schedule.

Regarding schedule, there are two overarching causes for slip: technical issues and budgetary changes. With respect to technical risk, I have the highest level of confidence that technical issues will NOT cause impact to Sandia's schedule performance, as we demonstrated through progress in FY13. I say this for two reasons. First, we do not view this program as inherently high technical risk, especially when compared with other product development programs conducted at Sandia. Second, we manage our contingency funds (~10%) in a manner that continuously buys down risk against a formalized risk register.

With respect to budgetary changes, I cannot be as sanguine. In FY13, sequestration impacts caused some technical activities to be moved into FY14. We estimated the schedule impact of those shifts to be relatively small—on the order of 2 to 3 months over the life of the program (within overall schedule contingency). However, at the time of this testimony, we are operating against a FY14 resource allocation that, on an annual basis, is at least 23% below the FY14 requirement, as contained in the most recent NNSA-approved Baseline Change Requests to the Selected Acquisition Report, approved in October 2013. Until the final FY14 Energy and Water Development Appropriations bill is enacted, NNSA does not have the authority to provide a definitive funding level for the program. Obviously, unless addressed, budgetary changes of this magnitude will have significant schedule impact. As with any large program activity, schedule slip will result in an increase in overall program cost. In addition to the points above, Sandia is aware of the fiscal challenges this program imposes on Congress. To further adherence to the schedule and cost, we are aggressively implementing an increased level of project management rigor to the B61–12 program. Our technical experts are partnered with project management professionals, skilled practitioners using a suite of formal tools, such as resource-loaded schedules, requirements tracking systems, and sophisticated risk management and mitigation methods. We are moving to an Earned Value Management System (EVMS), which is a way of quantitatively measuring where one is in the execution of a project regarding schedule and cost. While these approaches add to execution overhead, they provide essential insights and early indicators for a project of this scope and duration. With EVMS, we can use tailored assessments to look at cost and schedule performance indicators on a monthly basis, examine each subsystem, and track more accurately how each team is doing in developing those subsystems—and we can make immediate, early changes if necessary, applying more or fewer resources to each particular element of the project, as required.

We believe Sandia has an achievable plan and the technical risk is manageable under the WDCR, and at the time of my testimony we continued to be on schedule and on budget relative to the March 2020 first production unit (FPU) documented in the Selected Acquisition Report. We are adjusting our plans as the fiscal situation evolves and are confident that we have the expertise and tools in place to effectively manage the program going forward.

QUESTIONS SUBMITTED BY MS. SANCHEZ

Ms. SANCHEZ. Secretary Creedon, you noted that only after rigorous and thorough evaluation of each possibility did the Nuclear Weapons Council unanimously conclude that the B61–12 full-scope LEP was the least expensive long-term option that could meet military requirements. Was a detailed cost study done for the 1E option and presented to the Nuclear Weapons Council?

Secretary CREEDON. Yes a detailed cost study was done for the 1E option, it was presented to the Nuclear Weapons Council (NWC) and they rejected it in favor of the B61–12 LEP (3B option). The NWC rejected the 1E option primarily because it did meet all threshold requirements established by the NWC and it would require a second life extension program over its planned service life, significantly increasing the overall long-term cost. Option 1E also failed to consolidate any of the non-strategic variants of the B61 preventing significant reductions in the nuclear stockpile and any long-term cost savings this could provide.

Ms. SANCHEZ. What is the reason for consolidating the B61 mods? Is there a reason other than simplicity/streamlining the stockpile? Does it save NNSA or the Air Force money? If so, how much?

Secretary CREEDON. Consolidation of the B61 modifications provides cost savings over the long-term associated with simplifying and streamlining the surveillance, maintenance, and training requirement for the National Nuclear Security Administration and the Air Force, and this was a factor in the decision. Consolidating also meets the President's goals of reducing the numbers of nuclear weapons in the U.S. inventory by ultimately allowing a more than 50 percent reduction in the numbers of nuclear gravity bombs, and more significantly a more than 80 percent reduction in the amount of nuclear material contained within those bombs.

Ms. SANCHEZ. What are the expected cost-savings from doing the B61–12?

Secretary CREEDON. The largest and most substantial cost savings realized from completing the full scope B61–12 Life Extension Program (LEP) will be derived from other LEPs that will not be needed. It allows us to retire the B83 warhead, avoiding a refurbishment roughly estimated by the National Nuclear Security Administration (NNSA) to cost between $4 and $5B. By completing a single, full-scope LEP of the B61 instead of two separate, limited scope refurbishments, it will save roughly an additional $2B during the service life of the bomb. In addition, a limited amount of cost-savings will be found in the reduced requirements for NNSA surveillance, and Air Force training and maintenance due to retirement and consolidation of current gravity bombs into the single B61–12 bomb.

Ms. SANCHEZ. Since our allies are not contributing any funds to the $10–$12 billion cost of the B61 life extension program, have other measures to provide reliable extended deterrence been discussed in consultations with NATO capitals? Why, why not? Has the Administration discussed NATO contributing to B61 LEPs?

Secretary CREEDON. NATO Allies have not been asked to contribute funds to the cost of the B61 LEP, which is a U.S. weapon. Alliance members do contribute to the nuclear mission both with conventional support and with regard to NATO's nuclear posture. In this latter respect, through the NATO Security Investment Program, NATO allies provide funding for security and infrastructure enhancements and upgrades at European nuclear weapons storage sites. Moreover, NATO Allies burden-share in the nuclear mission both by assigning pilots and dual-capable aircraft to the mission, and by conventional support operations, such as the SNOWCAT program ("Support of Nuclear Operations with Conventional Air Tactics"). It would not be appropriate to ask NATO Allies to contribute to the cost of the B61 LEP both because it would subject classified U.S. nuclear data to disclosure to foreign nations, and because it could subject nations to charges of proliferation.

Ms. SANCHEZ. How much funding does NATO contribute to enabling the deployment of nuclear weapons in Europe?

Secretary CREEDON. NATO Allies contribute to deterrence through the NATO Security Investment Program (NSIP), which funds security and infrastructure enhancements and upgrades at European nuclear weapons storage sites. There have been four NATO weapons storage-related upgrades (Capability Package upgrades) since the original NATO Capability Package was approved in 2000:

	Project Total (M)[1]
Initial WS3 Installation	approx. $215M USD
Basic Capability Package (Jul 2000)	12.8M EUR
Addendum 1 (Feb 2005)	17.9M EUR
Addendum 2 (Apr 2006)	13.0M EUR
Addendum 3 (Mar 2009)	13.0M EUR

Addendum 4 (Aug 2011) 108M EUR

[1]NATO common funding derives from U.S. and other contributions. The U.S. burden-share costs are generally 24 percent of the NATO budget. The U.S. burden-share is generally 22–24 percent of the total NSIP costs. As a result, the NATO funds above include the U.S. contribution to NATO.

Additionally, bilateral agreements require the host-nation to provide "mission-related facilities, services, supplies and other logistical support" for our units at each of the six sites. These may generally be scoped down to facilities and utilities, but the type and level of services, as well as funding for services provided, vary at each location.

Ms. SANCHEZ. In the medium term, would it be possible to provide reliable extended deterrence without forward-deploying B61s?

Secretary CREEDON. The B61 warhead serves a unique and important role. It is the only non-strategic nuclear weapon in the U.S. arsenal, which means it can be delivered by tactical fixed-wing aircraft, such as F–15, F–16, and future F–35 jet fighters—including aircraft flown by our Allies in NATO. As such, it is one of the few areas where Allies can burden-share in the nuclear deterrence mission. The inability to forward deploy B–61s will undermine important U.S. assurance and deterrence commitments set forth in both the 2010 Nuclear Posture Review and the June 2013 nuclear employment guidance.

Ms. SANCHEZ. Senator Sam Nunn recently suggested that forward-deployed B61s in Europe are becoming more of a security risk than an asset for NATO. What is the security risk of having B61s forward-deployed? Are B61s currently safe and secure?

Secretary CREEDON. U.S. nuclear weapons deployed in Europe are safe and secure. The Weapon Storage and Security System (WS3), security, and custodial forces all combine to meet the Nuclear Weapon Security Standard. The NATO High Level Group Vice-Chair for Safety, Security, and Survivability oversees the efforts to ensure the security standards are continuously met—the same standards as the U.S.-based systems. Under the HLG authority, the Joint Theater Surety Management Group (JTSMG) manages the day-to-day nuclear surety mission in NATO. The security system is continuously evaluated to identify opportunities for further enhancement. Currently, there are several NATO-funded security enhancement projects in progress to enhance security force detection and awareness capabilities, and improve security response effectiveness at all storage sites in Europe. Additionally, all contributing nations continually work together to improve command and control, and security force techniques, tactics, and procedures (TTPs) through semi-annual modeling and joint force-on-force exercises. As a result, the B–61s assigned to NATO are safe and secure.

Ms. SANCHEZ. Where are we on the 3+2 strategy? Is this on track to be funded? What are the discussions to date? If the 3+2 plan is pursued, when would nuclear reductions occur?

Secretary CREEDON. We remain committed to the strategy and want to see it implemented in order to obtain its benefits, which include nuclear reductions. Our first Life Extension Program (LEP) implementing this strategy is the B61–12, and we won't know if that funding is on track until Congress completes its Fiscal Year (FY) 2014 budget work. The reductions from sequestration and delays in fiscal year 2013 funding from the continuous resolution have already caused a slip for first production unit from FY 2019 to FY 2020.

Reductions in the number of nuclear weapons resulting from the B61–12 deployment would begin in the mid to late 2020s, dependent upon when confidence is achieved in the B61–12 through surveillance testing. Nuclear reductions would typically occur about 7–9 years after first production unit of a modernized weapon depending upon the number of surveillance tests performed and the results of those tests.

The 3+2 strategy is at risk due to current budget constraints. Inter-operable 1 and the long-range stand-off weapons may also be delayed to fit within current budget constraints.

Ms. SANCHEZ. As part of the currently proposed plan for the B61 LEP, it appears the assumption is that the United States will continue to forward-deploy tactical versions of the B61 in Europe for the next 50 years. In addition, the new high-level nuclear weapons policy guidance signed by President Obama in June could reduce the number of strategic gravity bombs that are required for deterrence. How might changes to existing deterrence requirements alter the currently proposed scope of

the B61 LEP? And what is the assumption for the timeline for forward-deploying these weapons in Europe?

Secretary CREEDON. Both the 2010 Nuclear Posture Review report, and the Administration's 2013 nuclear employment guidance acknowledged the fact that the international security environment has changed dramatically since the end of the Cold War. Even with this change, however, the guidance set out in both documents acknowledged the importance of extended deterrence—both to send a credible signal to adversaries that any perceived benefits of attacking the United States and its Allies and partners are outweighed by the costs that our response would impose; and to assure Allies and partners that the United States is committed to their defense. Together, these documents demonstrate the U.S. nuclear posture—including current plans for the B61 LEP—is suited to the current security environment and, by extension, to existing deterrence requirements. Currently, the First Production Unit for the B61–12 is scheduled for 2020 to support commitments. That said, we will continue to seek the goal of a world without nuclear weapons.

Ms. SANCHEZ. Would the planned surety enhancements that require changes to the nuclear package be required if B61s were kept in the U.S. rather than forward-deployed in NATO countries?

Secretary CREEDON. There are no planned changes to the nuclear package of the B61–12. The planned security enhancements would still need to be included as part of the B61–12 Life Extension Program regardless of the status of weapons based in NATO countries because of the Administration's stated requirement to retain the capability to forward deploy U.S. nuclear weapons on tactical fighter-bombers and heavy bombers outside of the continental United States.

Ms. SANCHEZ. a. What is the reason for consolidating the B61 mods?

Dr. COOK. a. The consolidation of the B61 Mods is an opportunity afforded by the Air Force Tail Kit, which eliminates the need to extend multiple B61 modifications and associated Air Force integration and sustainment costs. Additionally, there are significant benefits that will be gained by completing the B61–12 LEP, including:

- The majority of the air delivered gravity weapons will be removed from the U.S. nuclear stockpile (active and inactive).
- A very large reduction in the total amount of nuclear material utilized by air delivered gravity weapons in the U.S. nuclear stockpile.
- Significant reduction in the total nuclear yield (i.e., mega-tonnage) produced by air-delivered gravity weapons in the U.S. nuclear stockpile.

These planned reductions in the numbers of weapons, amounts of nuclear material, and total yield are dependent upon the successful completion of the B61–12 LEP. They are a key part of the Administration's long-term plan to demonstrate that we are meeting our Non-Proliferation Treaty Article VI obligation to make progress towards disarmament.

Ms. SANCHEZ. b. Is there a reason other than simplicity/streamlining the stockpile?

Dr. COOK. b. As stated above, there is a strong arms control component to Mod consolidation. Further, the use of the Air Force tail kit eliminates the need to re-establish production of the unique parachutes used by today's B61.

Ms. SANCHEZ. c. Does it save NNSA or the Air Force money? If so, how much?

Dr. COOK. c. Yes. Beyond reducing long term project Alt and LEP costs by approximately 50% (see answer to Question 16 & 17), there is a reduced sustainment cost to NNSA for a single B61–12 and no B83. Any reduced cost for the Air Force will have to be answered by the service.

Ms. SANCHEZ. What are the expected cost-savings from doing the B61–12?

Dr. COOK. NNSA's Defense Programs, Office of Program Integration, completed a B61 Alternatives Analysis in FY 2013. The analysis considered the current B61–12 mod consolidation strategy versus an alternative that would maintain the current family of B61s and the B83. The analysis demonstrated that the costs of the B61–12 LEP approach are approximately half of what would be required to maintain the existing bombs stockpile without Mod consolidation. The analysis compared the costs to maintain the B61–12 versus the existing gravity bombs stockpile (B61 family and B83) over 25-year and 50-year planning windows. For the B61–12 LEP, the analysis assumed a 20 year stockpile life and a second LEP is required in the 50 year planning window. For the existing bombs stockpile, the analysis assumed non-nuclear alterations on the B61–3, B61–4, B61–7 and B83–1 would be initially performed prior to 2030 and full LEPs on both bomb families before 2040. The B61–12 LEP, as currently authorized by the Nuclear Weapons Council and requested in the Administration's FY 2014 budget request, is the lowest cost option that meets military requirements. Any other alternative would not meet military requirements and would drive-up lifecycle costs for these modernization activities, which are necessary to realize the President's nuclear security vision.

Ms. SANCHEZ. How does the cost per unit for the B61–LEP compare with previous LEP costs for other nuclear weapons?

Dr. COOK. Cost per unit is dependent on the total production quantity, which is classified and available in the classified addenda of the B61–12 and W76–1 Selected Acquisition Reports. These unit costs are consistent between the programs in terms of the relative complexity and total production quantities.

Ms. SANCHEZ. We've known about many of the aging issues regarding certain critical non-nuclear components in the B61 for at least a decade. Why have we waited to address the highest priority aging issues in the B61 and why have we not replaced aging non-nuclear components such as vacuums tubes earlier?

Dr. COOK. NNSA prioritized stockpile modernization in accordance with funding, capacity, and assessed stockpile reliability. Replacement of the radars was originally planned to be addressed in conjunction with a non-nuclear life extension program (NNLEP) with a target FPU date in 2012. The target date was aligned with other limited life component (LLC) expirations. Due to competing priorities on the W76–1 program, the ability to field LLC expirations and other stockpile sustainment commitments the NNLEP and associated study was delayed. With the Phase 6.2/2A study conducted between 2009 and 2011, refurbishment of the nuclear explosive package was deemed necessary to avoid a second costly LEP in the near future. The consolidation of non-nuclear and nuclear work also limits the movement of weapons to and from deployed locations, minimizing any vulnerability associated with the movement of weapons.

Ms. SANCHEZ. Where are we on the 3+2 strategy? Is this on track to be funded? What are the discussions to date? If the 3+2 plan is pursued, when would nuclear reductions occur?

Dr. COOK. In November 2012, the Nuclear Weapons Council selected a baseline stockpile life extension plan that implements the "3+2" vision of which three interoperable warheads for ballistic missiles is an integral part. The baseline plan was detailed in a Nuclear Weapons Council memorandum dated January 15, 2013. The Nuclear Weapons Council plan establishes the framework to develop more detailed implementation plans for deployment of interoperable warheads. Over the coming months, NNSA and the Department of Defense will work together to continue to analyze cost, scope, schedule and other implications of this vision as a means to inform future decisions regarding the nuclear weapons enterprise. The FY 2015 President's Budget Request is under development. The budget requests will describe funding plans for the "3+2" vision for the next several years. Per the FY 2014 Stockpile Stewardship Management Plan, the vision is achievable, though it may require some modification and/or delay in the current funding environment. Stockpile quantities are determined by the Department of Defense.

Ms. SANCHEZ. As part of the currently proposed plan for the B61 LEP, it appears the assumption is that the United States will continue to forward-deploy tactical versions of the B61 in Europe for the next 50 years. In addition, the new high-level nuclear weapons policy guidance signed by President Obama in June could reduce the number of strategic gravity bombs that are required for deterrence. How might changes to existing deterrence requirements alter the currently proposed scope of the B61 LEP? And what is the assumption for the timeline for forward-deploying these weapons in Europe?

Dr. COOK. Uncertainty in the existing deterrence requirement reinforces the current B61–12 LEP option. The current option provides global flexibility in the strategic and tactical employment of the B61–12 and optimizes our hedging options. Assumptions for the timeline of forward deploying weapons must be addressed by DOD.

Ms. SANCHEZ. Would the planned surety enhancements that require changes to the nuclear package be required if B61s were kept in the U.S. rather than forward-deployed in NATO countries?

Dr. COOK. Yes. Even without the requirement to forward deploy the B61, this scope would be required.

Ms. SANCHEZ. The CAPE cost study noted Sandia's view that the B61 is 3 or 4 times more complex than the W76 LEP. Do you still agree? What are the challenges for Sandia related to the planned work scope for the B61?

Dr. HOMMERT. Following direction from the B61–12 Project Officers Group, chaired by the U.S. Air Force, the B61 LEP will consolidate four of the current versions, or Mods, of B61 bombs (the B61–3, B61–4, B61–7, and B61–10) into a single Mod, the B61–12. The result will be reduced U.S. Air Force nuclear weapon management complexity, as well as reduced U.S. Air Force cost for ongoing maintenance, training, and stockpile evaluation. This Mod consolidation is made possible through use of a Tail Kit, which is the responsibility of the U.S. Air Force and is designed to maintain existing military capability.

Complexity suggested in the question needs to be answered in relative to the technical work scope. I have the highest level of confidence that technical issues will NOT cause impact to Sandia's schedule performance, as we demonstrated through progress in FY13. I say this for two reasons. First, we do not view this program as inherently high technical risk, especially when compared with other product development programs conducted at Sandia.

At the system level complexity between the B61–12 and W76–1, Sandia's scope in the B61–12 involves more components and has the additional challenge to make the B61–12 compatible with five aircraft platforms

Sandia is applying documented lessons learned from our design work for the W76–1 and incorporating it to the B61–12 program throughout component work and system design. And, as we learn lessons from the B61–12 program, they will be utilized for the other programs underway and planned. The B61 LEP does not involve significant changes to environmental or functionality requirements; therefore, the inherent technical risk is lowered and will not impact the March 2020 FPU if the WDCR funding profile is sustained.

Challenges Sandia has faced and addressed are the impacts of the FY13 sequestration. We managed sequestration by moving some technical activities into FY14. Additionally, staffing up for the B61–12 was also a challenge. The staffing requirement for these modernization efforts exceeds 1,000 people. I am pleased to report that, despite numerous periods of budget uncertainty over the past two years, we have been extremely successful at staffing the program against a very aggressive staffing plan. Two staffing approaches have allowed us to achieve the required staffing levels for the modernization programs: (1) internal staff movements from other Sandia programs that require skills synergistic with those for the nuclear weapons program and (2) external hiring. Since 2010, we have hired some 500 advanced-degree scientists and engineers. The overall number of members of the workforce at the Laboratory remained essentially flat through this period. Of those we hired new to Sandia, approximately 58% are early in their professional careers. The modernization program provides opportunities for these new technical staff to work closely with our experienced designers: from advanced concept development to component design and qualification, and ultimately to the production and fielding of nuclear weapon systems.

We believe Sandia has an achievable plan and the technical risk is manageable under the WDCR, and at the time of my testimony we continued to be on schedule and on budget relative to the March 2020 first production unit (FPU) documented in the Selected Acquisition Report. We are adjusting our plans as the fiscal situation evolves and are confident that we have the expertise and tools in place to effectively manage the program going forward.

Ms. SANCHEZ. The technology for many of the LEP components were at TRL 3 or 4 as of August 2012. Are you on schedule and when do you plan to have most components at TRL 6 or higher?

Dr. HOMMERT. Yes, we are on plan for the technology maturation for the B61–12 components. The qualification plan for each major component includes a technology readiness forecast describing the required technological demonstrations required for the remaining TRL steps and a projection of when those steps will be reached. Based on the documented criteria for Technology Readiness Level 6, the components must demonstrate performance in the B61–12 flight conditions. Based on the schedule at the time of the testimony, these flight tests were planned for fiscal year 2015 prior to baseline design review assuming full WDCR funding.

Ms. SANCHEZ. Do you agree that NNSA and DOD must prioritize what it needs from the labs and sites over the next several years? And are the LEP schedules realistic from a lab perspective?

Dr. HOMMERT. The B61 LEP is the first and most urgent in a series of LEPs and ALTs required to sustain the U.S. nuclear stockpile into the future. We will support the Nuclear Weapons Council to maintain the stockpile for sustained deterrence for the coming decades. Accomplishing this work will require prioritization to achieve the appropriate strategy set by policymakers. Sandia will be poised to provide cost efficient, innovative, and successful strategies to future stockpile work based on the B61–12 and other programs. Our successful record of using common technologies and components across multiple systems that have been deployed in the U.S. stockpile has helped reduce development risk and manage development costs. We are extending this approach to development of the Arming, Fuzing, and Firing (AF&F) system. Today, a modular AF&F design is being developed for the W88 ALT 370, the Mk21 Fuze Replacement, and potentially for the W78/88–1 LEP.

QUESTIONS SUBMITTED BY MR. LANGEVIN

Mr. LANGEVIN. Under the current modernization plan, what happens to the B–83s? Will they be dismantled or kept in reserve?

Secretary CREEDON. Our plan is to retire the B83 warhead in the late 2020s and then dismantle it. It is the last megaton weapon in our stockpile, and we plan to eliminate it because we no longer need that much output from a weapon to meet our security needs. If we were to keep it, it would require a Life Extension Program to start within the next few years.

Mr. LANGEVIN. What role does the B–61 play in deterrence that cannot be achieved by ballistic missiles, cruise missiles, or other means, particularly in extended deterrence in Europe?

Secretary CREEDON. The B61 warhead serves a unique and important role that cannot be achieved by other means, including ballistic or cruise missiles. It is the only non-strategic nuclear weapon in the U.S. arsenal, which means it can be delivered by dual-capable (i.e., tactical fixed-wing) aircraft, such as F–15, F–16, and future F–35 jet fighters—including ones flown by NATO. Moreover, unlike a nuclear weapon in an underground silo or in an underwater submarine, it assures Allies and partners by providing them with a visible and tangible demonstration of the seriousness of the U.S. extended deterrence commitment. Finally, it is flexible in that, even after being dispatched on a mission, the aircraft can be recalled any time before delivering its ordnance. Based on these differences, the B61 plays a vital role in U.S. extended deterrence.

Mr. LANGEVIN. Are there military missions filled by the B–61 that cannot be met by other systems? Would the requirement for the B–61 persist if gravity weapons were removed from Europe? How would development of the LRSO affect the need for the B–61?

Secretary CREEDON. There are still some military missions that cannot be filled by conventional weapons or other components of the nuclear Triad and require a nuclear gravity bomb. The requirement for the B61–12 Life Extension Program would remain regardless of the status of U.S. nuclear weapons in Europe. The Administration requires that the DOD maintain the capability to forward deploy U.S. nuclear weapons on tactical fighter-bombers and heavy bombers and the B61 is the only nuclear weapon currently capable of being carried on a tactical fighter bomber. Development of the long-range standoff weapon would not change the need for the B61–12 LEP as both air delivered weapons provide distinctively different and complementary capabilities and employment options.

Mr. LANGEVIN. NNSA has a very aggressive modernization portfolio to manage, with 4–5 concurrent life extension programs for many years into the future. How does the NNSA plan to manage these without cost and schedule issues, particularly given the complexity of the B–61 LEP?

Dr. COOK. The 4–5 concurrent LEPs referred to are in different phases that place different demands on the nuclear security enterprise. Phase 6.2/2A (Feasibility and Cost Study) activities tend to be focused on technology maturation and computationally supported analysis and mostly involves the weapons laboratories. Phase 6.3 (Development Engineering) is focused on the design and testing of components and subsystems that make use of design and computational capabilities along with testing facilities at the laboratories and preliminary production engineering at the potential production facilities. Phase 6.3 continues as Phase 6.4 ramps up as decisions on specific technologies and designs are decided upon and the production facilities perform process prove-in to ensure war reserves (WR) quality parts can be reliably produced. Laboratory involvement in the LEPs tends to peak just prior to FPU after which their support is required to resolve production issues. Production facilities carry most of the workload/effort following Phase 6.5 (FPU) and into Phase 6.6 full rate production. The W76 LEP is currently in full rate production to be completed by FY 2019. The B61 LEP will reach FPU in FY 2020 with Phase 6.3 activities currently underway. The cruise missile and IW–1 LEPs have FPUs in FY24 and FY25, respectively so most of their Phase 6.3/6.4 activities will occur after Phase 6.5/6.6 activities have commenced for the B61. The scheduling of these LEPs has been subject to enterprise modeling to establish the feasibility of their concurrent execution and to identify and resolve potential "choke points" in capability. Additionally, the recent workforce prioritization study conducted by NNSA determined that the NNSA sites were capable of staffing these activities in addition to staffing other ongoing critical activities such as surveillance and assessment (contingent on the provision of sufficient funding). Critical to planning and integrating all these activities will be federal leadership. Defense Programs recently reorganized to establish the Office of Major Modernization Programs (NA–19) to focus management of LEPs and major construction projects in support of modernization of key capabilities

separate from the day to day maintenance of the stockpile. Defense Programs also established the Office of Systems Engineering and Integration (NA–18) to put systems engineering and integration tools in place to better apply these tools to the LEPs, major construction efforts, and the overall program. In addition, the Office of Infrastructure and Operations was established to focus on maintaining, operating, and modernizing the National Security Enterprise. It is critical to remember that funding for NNSA infrastructure investments is also limited. Funding for NNSA infrastructure investments is also limited. This could cause system- or facility-level failures in the enterprise that would preclude safe and secure operations, causing unplanned delays in the B61 LEP and other programs.

Mr. LANGEVIN. Under the current modernization plan, what happens to the B–83s? Will they be dismantled or kept in reserve?

Dr. COOK. Defense officials have stated that once the B61–12 LEP is completed, and the Department of Defense has sufficient confidence in the resulting warhead, the Defense Department would be in a position to pursue retirement of the B83 gravity bomb. Retired warheads are no longer part of the stockpile and are eventually dismantled.

Mr. LANGEVIN. Dr. Cook, in November 2011, the cost estimate for the B–61 was $5 billion. In July 2012, it was $7.9 billion, and now it is at $8.1 billion, and reports are that the 2012 CAPE estimate is over $10 billion. What accounts for these increases? If sequestration continues in FY14, can we expect further increases in cost? And frankly, why should we have faith in the current estimates?

Dr. COOK. NNSA reported a $4B number in the FY 2012 Stockpile Stewardship Management Plan (SSMP) and stated that the "definitive estimate" would not be established until after the completion of the Weapon Design and Cost Report (WDCR) and Phase 6.2A study in 2011. By "definitive" NNSA meant an official cost estimate for the program using formal criteria based cost estimating process. This $4B number reported in the FY 2012 SSMP was based on a parametric estimate developed in 2009 prior to the establishment of the B61–12 product teams, documentation and assessment of military requirements, and completion of the feasibility and cost study. Following the 6.3 decision, NNSA and the U.S. Air Force finalized the requirements for the selected LEP option, and finalized the B61–12 WDCR in July 2012. After further work on risk mitigation and schedule integration, the NNSA submitted the initial cost estimate for the B61–12 LEP to Congress in May 2013, with the first formal Selected Acquisition Report (SAR). Other than to account for the added schedule driven by sequestration cuts in FY 2013, that baseline cost estimate has not deviated from the WDCR from July 2012. The current cost estimate reported in the September 2013 Selected Acquisition Report to Congress is $8.1B which includes $7.3B in direct B61–12 funding and another $0.8B in other NNSA funds. NNSA is submitting quarterly updates to Congress on cost and schedule and will formally update the cost estimate following the Baseline Design Review to establish an Acquisition Program Baseline in FY 2016. The official WDCR estimate is founded on firm military requirements and a disciplined approach to product realization informed by historical data. This is a significant investment consistent with other major weapon-system acquisitions. To keep the program on schedule and to control cost, NNSA has implemented rigorous systems engineering and program management practices. As required each quarter, NNSA will submit to Congress our continued progress in subsequent Selected Acquisition Reports.

Mr. LANGEVIN. What cost components to the B–61 LEP will have to be incurred as part of future LEPs, regardless of any changes to the B–61 LEP?

Dr. COOK. The $811M "other program funds" that are reported in the B61–12 Selected Acquisition Report are enabling technologies and production capabilities that will be utilized by future LEP and ALTs. Additionally, many of the component designs and technologies being deployed on the B61–12 will support other programs. Examples include:

- Common radar and associated testers and tooling is a common technology that is shared between the W88 ALT 370 and expected to be deployed on future LEPs
- B61–12 stronglink technologies and associated testers and tooling are common with the W88 ALT 370 and expected to be deployed on future LEPs
- B61–12 weapon control unit, system II interface and aircraft integration testing will support future air delivered LEP and ALTs including a cruise missile warhead for the Air Force Long Range Standoff program.
- Qualification and certification of PBX9502 Insensitive High Explosives (IHE) production capabilities will support future LEPs.

Mr. LANGEVIN. What cost components to the B–61 LEP will have to be incurred as part of future LEPs, regardless of any changes to the B–61 LEP?

Dr. HOMMERT. Regarding the B61, in recent years, my annual assessment letters have documented concerns related to technology obsolescence and aging. While the B61 is currently safe and secure, these concerns continue to increase. For example, in the past three years, we have observed time-dependent degradation not seen before in electronic, polymer, and high-explosive components. This observation is not surprising given the age of the B61 weapon system, the oldest units of which were manufactured and fielded in the late 1970s with some components dating back to the 1960s. To sustain the B61 into the next decade and beyond requires these known issues to be addressed as planned and being executed by Sandia. The program is also addressing technology obsolescence. Electronic components of the B61 were designed and manufactured decades ago. Outdated technologies, such as vacuum tubes, are exhibiting performance degradation and are difficult to evaluate and assess with confidence.

Any scope changes to the B61–12 have a cost impact on the other programs currently underway. Wherever possible, component technologies have been selected to facilitate incorporation into emerging designs for the W88 ALT 370, Mk21 Fuze replacement, and other additional potential modernization efforts.

QUESTIONS SUBMITTED BY MR. COFFMAN

Mr. COFFMAN. Given that the B61 LEP is an extremely expensive life extension program, do you believe that our NATO allies should bear a financial burden for their security, especially in light of the current budget environment in the U.S.; and the fact that one of the most oft-stated rationales for the LEP is to support U.S. commitments to NATO?

Secretary CREEDON. NATO Allies already bear a financial burden for Alliance security both with their conventional forces and in regard to NATO's nuclear posture. In this latter respect, through the NATO Security Investment Program, NATO allies provide funding for security and infrastructure enhancements and upgrades at European nuclear weapons storage sites. Moreover, NATO Allies burden-share in the nuclear mission both by assigning pilots and dual-capable aircraft to the mission, and by supporting the nuclear mission with conventional operations (such as the SNOWCAT program—"Support of Nuclear Operations With Conventional Air Tactics").

QUESTIONS SUBMITTED BY MR. BROOKS

Mr. BROOKS. I understand the Senate Appropriations Committee has proposed cutting the B61 LEP by 31% for FY14 and is encouraging NNSA to reduce the scope of the LEP. For all of our witnesses, what would be the impact of this cut, were it to be become law? a. If the B61 LEP were canceled or de-scoped to the "triple-alt" today, what would be the short term cost savings? What would be the long-term cost increases? b. The Senate Appropriations Committee has also cut all money for the Air Force's tail kit portion of the B61 LEP. If the tail kit is not funded, what are the impacts on the LEP? What are the cost impacts? Is it possible to do the LEP without doing the tailkit?

Secretary CREEDON. To cut the B61 LEP to such an extent this year would significantly delay its delivery, and dramatically increase the overall cost to complete any LEP of the bomb. a) There would be absolutely zero short-term cost savings achieved by canceling or "descoping" the B61–12 LEP. There would be several long-term cost increases, many of which would be transferred to future planned LEPs that had intended to leverage cost savings by utilizing many of the same non-nuclear components being developed for the B61–12. Additionally, we would be unable to retire the B83 warhead, forcing us to begin a costly LEP of that bomb roughly estimated by the National Nuclear Security Administration (NNSA) to cost $4–$5B, and we would also need to start planning a second LEP of the B61 to refurbish those components that were not included in the "triple-alt." That second B61 LEP is roughly estimated by NNSA to cost $5–$6B dollars. b) If funding for the B61–12 tail kit assembly (TKA) were cut, the B61–12 would not be possible, and this would not be the only nuclear gravity-dropped weapon in the nuclear stockpile. Without the TKA the currently planned consolidation of four versions of B61 and the planned retirement of the B83 could not happen. As mentioned previously, if it is not possible to retire the B83 it will need a separate LEP estimated by NNSA to cost roughly $4–$5B. The Air Force and NNSA could conduct an LEP on the various variants of the B61, but in the absence of the TKAS the consolidation would not happen.

Lastly if either the B61–12 LEP is de-scoped/cancelled or the B61–12 TKA is cancelled, it will be impossible to achieve the planned 53 percent reduction in total nuclear gravity weapons or the 83 percent reduction in total nuclear material contained within the nuclear gravity weapons in the U.S. nuclear stockpile.

Mr. BROOKS. a. I understand the Senate Appropriations Committee has proposed cutting the B61 LEP by 31% for FY14 and is encouraging NNSA to reduce the scope of the LEP. For all of our witnesses, what would be the impact of this cut, were it to be become law? What would be the long-term cost increases? The Senate Appropriations Committee has also cut all money for the Air Force's tail kit portion of the B61 LEP. If the tail kit is not funded, what are the impacts on the LEP? What are the cost impacts? Is it possible to do the LEP without doing the tailkit?

Dr. COOK. a. The Nuclear Weapons Council in December 2011 selected the Option 3B with an FPU in 2019 as the program for the B61–12 LEP. This option was chosen to satisfy the threshold (minimum) requirements at the lowest life cycle cost. The B61–12 LEP is now in its second year of full scale engineering development and is no longer a study. Any significant change in scope requires NNSA to renegotiate military requirements with the DOD and develop a new Weapon Design and Cost Report, cost estimate and schedule. There would also be impacts on component designs carried forward into the new scope which would require re-design to make them backwards compatible with multiple legacy B61 modifications. The renegotiation of requirements, new schedule and re-design effort would delay any new scope for 1–2 years. If the B61 12 LEP were not able to maintain its current schedule, then the program would face delays and increased costs. The B61–12 LEP would continue, but the savings from consolidations and retirements would also be delayed, further increasing future costs.

Mr. BROOKS. b. If the B61 LEP were canceled or de-scoped to the "triple-alt" today, what would be the short term cost savings?

Dr. COOK. b. Although there may be some initial savings, NNSA would need to begin a new life extension study effort to address aging in components not addressed by the smaller scoped "triple alt." There will be additional costs to NNSA and the DOD to sustain the multiple modifications over the next two decades and NNSA would not be able to plan for the retirement of the B83. The life cycle costs are roughly double with the piece meal approach. In summary, canceling the B61 12 LEP would offer few, if any, short-term budgetary advantages while creating significant long-term strategic and budgetary challenges

Mr. BROOKS. c. The Senate Appropriations Committee has also cut all money for the Air Force's tail kit portion of the B61 LEP. If the tail kit is not funded, what are the impacts on the LEP?

Dr. COOK. c. In the early 2000s, the U.S. made the decision to discontinue the capability to produce the special parachutes used in the legacy nuclear bombs. The last technician with experience making these parachutes retired years ago. Additionally, some of the delivery modes that used the parachutes were the most challenging to certify and the most dangerous for our Air Force pilots. The decision to use an Air Force-provided tail kit improves the survivability of our pilots, reduces the certification challenge for our laboratories, and eliminates the need for a parachute. As an additional benefit, U.S. Strategic Command determined that with the accuracy provided by a tail kit, the yield provided by today's lowest yield B61 variant would be sufficient to meet all of the strategic and non-strategic requirements for gravity systems. As a result, there is no longer any need to design, develop, certify, or maintain multiple variations of the B61.

Mr. BROOKS. d. What are the cost impacts?

Dr. COOK. d. The scope of the LEP or LEPs would need to be re-negotiated without Mod consolidation. Costs will also increase to sustain the four nuclear explosive packages (NEP) types versus one to meet another 20-year service life. The magnitude of the increase is dependent on what is deemed adequate for reuse and what must be remanufactured. Many non-nuclear components can be common but unique NEP designs require some different electronics and components to meet specific fuzing modes and surety themes. The renegotiation of requirements, qualification programs, and redesigns would take up to 24 months to implement and push FPU to 2021–2022.

It is difficult to assess how much the total costs will increase without the re-negotiation of requirements, re-design and assessment on component reuse or remanufacture, including parachutes, as part of a new Phase 6.2A study and development of a Weapon Design and Cost Report. However, it is clear that this new scope will delay FPU and increase overall costs. Also, by not consolidating and producing quantities consistent with Nuclear Weapon Council decisions, DOD will still require the B83 1. Based on current aging trends and limited life component data, additional life extension work on the B83–1 will be required with a FPU as early as

2027. This cost is above and beyond the costs of performing multiple LEPs on the various B61 modifications.

Mr. BROOKS. I understand the Senate Appropriations Committee has proposed cutting the B61 LEP by 31% for FY14 and is encouraging NNSA to reduce the scope of the LEP. For all of our witnesses, what would be the impact of this cut, were it to be become law? a. If the B61 LEP were canceled or de-scoped to the "triple-alt" today, what would be the short term cost savings? What would be the long-term cost increases? b. The Senate Appropriations Committee has also cut all money for the Air Force's tail kit portion of the B61 LEP. If the tail kit is not funded, what are the impacts on the LEP? What are the cost impacts? Is it possible to do the LEP without doing the tailkit?

Dr. HOMMERT. For a cut of this magnitude, significant schedule slips would be expected to the Sandia portion of the B61–12 development scope planned for FY14.

Although the final FY14 budget is not finalized, there are risks from FY14 funding lower than requested by NNSA. In FY13, sequestration impacts caused some technical activities to be moved into FY14. We estimated the schedule impact of those shifts to be relatively small—on the order of 2 to 3 months over the life of the program (within overall schedule contingency). However, at the time of this testimony, we are operating against a FY14 resource allocation that, on an annual basis, is at least 23% below the FY14 requirement, as contained in the most recent NNSA-approved Baseline Change Requests to the Selected Acquisition Report, approved in October 2013. Until the final FY14 Energy and Water Development Appropriations bill is enacted, NNSA does not have the authority to provide a definitive funding level for the program. Obviously, unless addressed, budgetary changes of this magnitude will have significant schedule impact. As with any large program activity, schedule slip will result in an increase in overall program cost. We recognize the overall fiscal environment in which we are operating and will work at all times to minimize cost growth as a result of budget-induced schedule slip.

First, it is my strongly held view that the current scope for the B61 LEP is the minimum necessary to meet the threshold requirements for the B61 provided by the Department of Defense and NNSA. (Any change to the current scope being executed at Sandia will have a short term cost increase. Sandia would have to halt its current work and initiate a 6.2/6.2A design definition and cost study which is a lengthy process required for work such as LEPs.

Second, NNSA has not conducted a comprehensive WDCR on a different scope program so I cannot assess the fiscal impact of a different program. However, any scope changes must be jointly agreed to by NNSA and DOD; specifically STRATCOM which must review the strategic deterrence needs of the U.S. and how a reduced scope would affect that capability. While DOD and the U.S. Air Force can provide further information, based on our work sustaining the legacy B61 stockpile, the U.S. Air Force would have to maintain the current variants of the B61 stockpile and lose the benefit of consolidation. Furthermore, there may higher costs because the Triple Alt does not forestall the need for a B61–12 Life Extension Program in the near future to address drivers not accounted for in the limited program.

Lastly, any scope reduction has the potential to require Sandia to jettison the previously completed design and qualification work underway for the current LEP. Sandia will have to start its work all over because of the change in design. There will also be concurrent impacts to the W88 ALT and Mk 21 fuze which currently utilize several B61–12 LEP components. Schedule slips to the B61–12 due to rescoping will ripple to these programs as well and could increase their costs.

Although it is possible to complete a life extension without a tailkit, to do so would result in a weapon system that either fails to meet the mod consolidation or military effectiveness requirements sought by the Nuclear Weapons Council and STRATCOM. The limitations of this approach would need to be reviewed with the DOD (particularly STRATCOM) to consider implications on long range strategic planning and extended deterrence. DOD experts would better be able to speak to these implications.

QUESTIONS SUBMITTED BY MR. GARAMENDI

Mr. GARAMENDI. How does the nuclear long-range strike stand-off (LRSO) missile contribute to extended deterrence? Do we need both the B61 bomb and the nuclear LRSO if the LRSO contributes to extended deterrence?

Secretary CREEDON. Both the LRSO and the B61 will contribute to extended deterrence in support of our Allies. The LRSO, once fielded, will be a significant contributor to the U.S. strategic and regional deterrence missions. The LRSO will be able to provide enhanced standoff capability against adversaries with more ad-

vanced air defense, anti-access, or area denial capabilities. The B61 is the visible, tangible, forward deployed weapon for extended deterrence; while the LRSO provides a reinforcing strategic bomber alternative that further enhances our support to Allies and Partners.

Given the spectrum of modern day threats and the growing problem of nuclear proliferation in the 21st century, the President has directed that the U.S. will maintain both a strategic nuclear triad and non-strategic nuclear force capabilities to deter adversaries and assure allies and partners. By developing and deploying an LRSO capability, and retaining the B61, the U.S. will enhance the credibility and effectiveness of strategic and non-strategic nuclear forces even as we transition to lower numbers in the stockpile. These systems coupled with the land-based and sea-based legs of the triad, and U.S conventional capabilities will ensure the President has a wide-range of options, at his disposal, in times of crisis. Retaining the B61 and deploying an LRSO capability reinforces the U.S. commitment to defend vital national interests and those of our allies and partners.

Mr. GARAMENDI. How many B61–12 nuclear weapons will be produced, and how many rebuilt B61–12 bombs does the U.S. need for deterrence? How many are required for tactical use and how many are required for strategic use? How many nuclear weapons will be eliminated as a result of the B61–12 mod?

Secretary CREEDON. [The information referred to is classified and retained in the committee files.]

Mr. GARAMENDI. Can the B83 yield be increased and decreased (dialed up or down)? Please provide yield options (in classified format if necessary). If so, could it serve as the deterrent in place of the B61–12?

Secretary CREEDON. [The information referred to is classified and retained in the committee files.]

Mr. GARAMENDI. Could the B83 or B61–7 be carried by fighter aircraft?

Secretary CREEDON. The B61–7 and the B83 warhead could be carried on fighter aircraft although there may be some compatibility issues to be resolved. However, they could not be used by fighter aircraft in forward-deployed operations because they lack a required security feature.

Mr. GARAMENDI. Could the B61–7 only serve as a deterrent in place of the B61–12?

Secretary CREEDON. No. The B61–7 is facing significant aging issues and would require an extensive Life Extension Program (LEP) to remain in the stockpile. Its LEP scope would be the same as the B61–12 unless the tail kit was eliminated. In addition, the yields on the B61–7 would not meet military needs as effectively as those on the B61–12.

Not having a tail kit would prevent stockpile reductions because it would prevent modification consolidation.

The B61–12 is more than a single weapon modernization. It is part of a plan to maintain an effective deterrent, provide an acceptable extended deterrent solution our Allies, and enable significant stockpile reductions. We cannot achieve those objectives with any single bomb in our current arsenal or with a cruise missile.

Mr. GARAMENDI. Can the B61–12 be used on any existing cruise missiles and future cruise missiles?

Secretary CREEDON. [The information referred to is classified and retained in the committee files.]

Mr. GARAMENDI. What is plan B if the currently planned B61–12 LEP does not get full funding or is delayed, in either FY14 or in the following years? Is a contingency plan being considered? What are the contingency plans for refurbishing the B61 and to maintain our commitments to NATO if the delay for the first production unit slips past 2020?

Secretary CREEDON. [The information referred to is classified and retained in the committee files.]

Mr. GARAMENDI. Ms. Creedon, you noted that, "The B61–12 LEP will consolidate multiple variants into a single design, which offers opportunities for significance stockpile reductions while maintaining national security objectives and extended deterrence commitments." When will these reductions occur? Is consolidation a military requirement?

Secretary CREEDON. We would begin consolidating B61 warhead variants as soon as production begins in Fiscal Year (FY) 2020 and complete the consolidation of the four B61 variants at the completion of B61–12 production, currently scheduled in FY 2024. As soon as we achieve confidence in the B61–12 LEP, at this time estimated to occur around FY 2029 we would retire the B83 and the last remaining B61 variant. The consolidation is a military requirement that offers prudent stewardship of tax payer dollars.

Mr. GARAMENDI. Secretary Creedon, are you confident that NNSA can manage the 4–5 concurrent LEP workload?

Secretary CREEDON. We are confident that NNSA can manage the current scope of work required to meet long-term requirements. Concurrency of work remains a concern, and therefore our plan is structured not to exceed the capacity of NNSA facilities by sequencing programs and by utilizing reuse of components where possible to minimize both costs and infrastructure utilization.

Mr. GARAMENDI. Is the plan still for a first production unit of the W78/88 in 2025? Are there considerations of delaying or canceling the W78/88 in the near-medium term?

Secretary CREEDON. The current plan still has the W78/88–1 first production unit (FPU) in 2025. Given the expected budget during the next five years, there are ongoing discussions about delaying this program. Delaying the W78/88–1 would be a difficult decision.

Mr. GARAMENDI. How many B61–12 nuclear weapons will be produced, and how many rebuilt B61–12 bombs does the U.S. need for deterrence? How many are required for tactical use and how many are required for strategic use? How many nuclear weapons will be eliminated as a result of the B61–12 mod?

Dr. COOK. That information is available and can be provided in a classified format or through a classified presentation.

Mr. GARAMENDI. Can the B83 yield be increased and decreased (dialed up or down)? Please provide yield options (in classified format if necessary). If so, could it serve as the deterrent in place of the B61–12?

Dr. COOK. Table 2–1 in Chapter 2 of the classified annex to the FY 2014 Stockpile Stewardship and Management Plan has yields for all current U.S. nuclear warheads. Roles and missions for our nuclear warheads are determined by the Department of Defense.

Mr. GARAMENDI. a. What is plan B if the currently planned B61–12 LEP does not get full funding or is delayed, in either FY14 or in the following years?

Dr. COOK. a. To the extent possible, NNSA is committed to providing the funding necessary to complete the B61–12 by FY 2020.

Mr. GARAMENDI. b. Is a contingency plan being considered?

Dr. COOK. b. Contingency is always part of our planning process and any further delays will require close coordination with the DOD in order to maintain the necessary deterrent.

Mr. GARAMENDI. c. What are the contingency plans for refurbishing the B61 and to maintain our commitments to NATO if the delay for the first production unit slips past 2020?

Dr. COOK. c. These contingency plans consider both the B61–12 production and the sustainment of the B61–3, -4, -7, and -10s to gap any additional delays to the B61 12 program. A classified report was provided as part of an addendum to the FY 2013 Selected Acquisition Report (SAR), dated May 2013. The classified addendum outlines the mitigation strategies and timelines and can be provided if requested.

Mr. GARAMENDI. Dr. Cook, you noted that "Other strategies to extend the life of the many current variants of the B61 and the B83 would likely be double the cost compared to continuing progress on the B61–12." Please provide a detailed cost assessment comparing the costs for the current path (including the currently planned B–61 LEP (3B option) and the planned 2033 B61–12 LEP) to (1) the costs for less ambitious B61 LEP (1E option) and any required follow-on LEP in the 2020s (that might take the place of the planned 2033 LEP), and (2) to the cost of a B83 LEP.

Dr. COOK. A detailed cost assessment is not available and would require additional time, resources and engagement with the DOD to assess requirements and possible alternatives. However, the NNSA's Defense Programs, Office of Program Integration recently completed a B61 Alternatives Analysis in FY 2013 using rough order of magnitude estimates. The analysis considered the current mod consolidation strategy versus an alternative that would maintain the current family of B61s and the B83 without the B61–12 LEP. While the analysis did not specifically call out option 1E, sufficient similarities exist to make this comparison applicable. The analysis compared the costs to maintain the B61–12 versus the existing gravity bombs stockpile (B61 family and B83) over 25-year and 50-year planning windows. For the B61–12 LEP the analysis assumed a 20 year stockpile life, and that a second LEP would be required in the 50 year planning window. For the existing bombs stockpile the analysis assumed non-nuclear alterations on the B61–3, -4, -7 and B83–1 would be initially performed prior to 2030, and full LEPs on both bomb families before 2040. This analysis demonstrated that the costs of the B61–12 LEP approach are approximately half as much than to maintain the existing bombs stockpile. The B61–12 LEP, as currently authorized by the Nuclear Weapons Council and

requested in the Administration's FY 2014 budget request, is the lowest cost option that meets military requirements. Any other alternative would not meet military requirements and would drive-up lifecycle costs for these modernization activities necessary to realize the President's vision.

Mr. GARAMENDI. Dr. Cook, please provide details on how much has NNSA spent to date on engineering work for the option 3B option (costed versus obligated funds).

Dr. COOK. As reported in the September 2013 Selected Acquisition Report, NNSA has expended $385M of direct program funding for Engineering Development. In the B61–12 Report to Congress dated July 2012, NNSA reported a total of $634M in study and technology maturation cost prior to the start of Engineering Development. Including $90M of Other Program Money, the total as of September 2013 is $1.1B.

Mr. GARAMENDI. Dr. Cook, how does NNSA plan to manage 4–5 concurrent LEPs without cost increase and schedule delays?

Dr. COOK. The 4–5 concurrent LEPs referred to are in different phases that place different demands on the nuclear security enterprise Phase 6.2/2A (Feasibility and Cost Study) activities tend to be focused on technology maturation and computationally supported analysis and mostly involves the weapons laboratories. Phase 6.3 (Development Engineering) is focused on the design and testing of components and subsystems that make use of design and computational capabilities along with testing facilities at the laboratories and preliminary production engineering at the potential production facilities. Phase 6.3 continues as Phase 6.4 ramps up as decisions on specific technologies and designs are decided upon and the production facilities perform process prove-in to ensure war reserves (WR) quality parts can be reliably produced. Laboratory involvement in the LEPs tends to peak just prior to FPU after which their support is required to resolve production issues. Production facilities carry most of the workload/effort following Phase 6.5 (FPU) and into Phase 6.6 Full rate production. The W76 LEP is currently in full rate production to be completed by FY 2019. The B61 LEP will reach FPU in FY 2020 with Phase 6.3 activities currently underway. The cruise missile and IW–1 LEPs have FPUs in FY24 and FY25, respectively so most of their Phase 6.3/6.4 activities will occur after Phase 6.5/6.6 activities have commenced for the B61. The scheduling of these LEPs has been subject to enterprise modeling to establish the feasibility of their concurrent execution and to identify and resolve potential "choke points" in capability. Additionally, the recent workforce prioritization study conducted by NNSA determined that the NNSA sites were capable of staffing these activities in addition to staffing other ongoing critical activities such as surveillance and assessment (contingent on the provision of sufficient funding. Critical to planning and integrating all these activities will be federal leadership. Defense Programs recently reorganized to establish NA–19 (Office of Major Modernization Programs) to focus management of LEPs and major construction projects in support of modernization of key capabilities separate from the day to day maintenance of the stockpile. Defense Programs also established NA–18 (Systems Engineering and Integration) to put systems engineering and integration tools in place to better apply these tools to the LEPs, major construction efforts, and the overall program.

In addition, the Office of Infrastructure and Operations was established to focus on maintaining, operating, and modernizing the National Security Enterprise. It is critical to remember that funding for NNSA infrastructure investments is also limited. Funding for NNSA infrastructure investments is also limited. This could cause system- or facility-level failures in the enterprise that would preclude safe and secure operations, causing unplanned delays in the B61 LEP and other programs.

Mr. GARAMENDI. a. Is the plan still for a first production unit of the W78/88 in 2025?

Dr. COOK. a. Yes, the current estimated FPU for the W78/88–1 is FY 2025. The W78/88–1 LEP is the first interoperable warhead concept supporting the "3+2" nuclear strategy of three ballistic missile warheads and two air-launched warheads to reduce the numbers and types of nuclear weapons, consistent with the Nuclear Posture Review. The military requirements, cost and schedule promulgated by the Nuclear Weapons Council include requirements derived from both Air Force and Navy applications and improve the safety and security of the resulting warhead. The feasibility study has been developing options to meet these requirements.

Mr. GARAMENDI. b. Are there considerations of delaying or canceling the W78/88 in the near-medium term?

Dr. COOK. b. NNSA is working on contingency planning which ranges from maintaining the current scope and schedule of the W78/88–1 to extending the FPU.

Mr. GARAMENDI. What is plan B if the currently planned B61–12 LEP does not get full funding or is delayed, in either FY14 or in the following years? Is a contingency plan being considered? What are the contingency plans for refurbishing the

B61 and to maintain our commitments to NATO if the delay for the first production unit slips past 2020?

Dr. HOMMERT. To reiterate, my annual assessment letters have documented concerns related to technology obsolescence and aging. While the B61 is currently safe and secure, these concerns continue to increase. For example, in the past three years, we have observed time-dependent degradation not seen before in electronic, polymer, and high-explosive components. This observation is not surprising given the age of the B61 weapon system, the oldest units of which were manufactured and fielded in the late 1970s with some components dating back to the 1960s. As planned, the B61 LEP we are currently executing addresses all known aging-related issues and meets the minimum threshold requirements

Regarding extended deterrence, officials in the Office of the Secretary of Defense are suited to provide a reply to the question. Sandia can provide additional information related contingency plans in a closed briefing for Representative Garamendi and the Subcommittee staff.

QUESTIONS SUBMITTED BY MR. CARSON

Mr. CARSON. There has been significant investigations conducted by my colleagues in the SASC on counterfeit microelectronics. I was pleased to see the significant work done in my home state at Crane Naval Surface Warfare Center to ensure trust in strategic weapon systems. As you know, one of the difficulties we face is in identifying manufacturing facilities or foundries that produce the counterfeit parts and put them into the DOD and DOE supply chain. Could you explain the DOE and DOD efforts currently under way to ensure trust in our microelectronics for the nuclear weapon modernization program?

Dr. COOK. DOD and DOE participate in monthly meetings of the Trusted Systems Network Roundtable where DOD agencies and commands address issues associated with threats to military hardware and software, including information technology systems. In addition, the NNSA is coordinating with the DOD on Program Protection Plans for the B61–12 LEP and the bomb tailkit, respectively. Recently, NNSA has expanded efforts to address this vulnerability to the W88 Alt 370 fuse replacement. NNSA is coordinating with the Office of Intelligence and Counterintelligence to address the any threat to the supply chain perpetrated by nation state or other adversaries with intent to subvert the NNSA mission. DOE/NNSA is also mandated to participate in the Government-Industry Data Exchange Program (GIDEP). Counterfeit items identified by DOD and, other participating agencies, which are reported to GIDEP, are reviewed within the DOE Office of Health Safety and Security (HSS). Any counterfeit item reports deemed to potentially affect Program(s) across the DOE, including the NNSA organization, are disseminated to the DOE/NNSA Sites and their M&O contractors. DOE/NNSA-identified counterfeit items are also required to be reported to HSS and, if substantive, may also be reported to GIDEP for information exchange.

QUESTIONS SUBMITTED BY MR. NUGENT

Mr. NUGENT. Dr. Cook, what impact will a FY14 full year continuing resolution have on the B61 LEP?

Dr. COOK. Under the current CR, the B61–12 is operating at $369M as opposed to the PBR of $537M or the Selected Acquisition Report estimated requirement of $561M. If the program remains at the $369M level through FY 2014, it would significantly impact the ability to meet the B61–12 LEP first production unit (FPU) date. The reduced funding would require a reduction in the current B61–12 technical staff levels, elimination of development hardware procurements, and cancellation of joint test activities with the USAF. The lack of new hardware would also impact component development activities and testing for FY 2015. The FPU in March 2020 could not be achieved, and could possibly slip into FY 2021. In addition, funding for NNSA infrastructure investments is also limited. This could cause system- or facility-level failures in the nuclear security enterprise that would preclude safe and secure operations, causing unplanned delays in the B61 LEP and other programs.

Mr. NUGENT. The 2010 Nuclear Posture Review states that the B61 Life Extension Program would deliver a First Production Unit to the Air Force in FY17. Last year, the Administration proposed delaying that until FY19. Now it appears that sequestration has delayed First Production Unit until FY20.

Dr. Hommert, in your professional technical judgment at what point does further delay result in too much risk? Do you believe the B61 LEP schedule can be slipped

again without impacts to the safety, security and reliability of the weapon? What are the primary drivers that might cause the schedule to slip again? Is it technical problems, programmatic problems or budget uncertainty?

Dr. HOMMERT. As described in my annual classified assessment provided to Congress (and briefed to the Subcommittee earlier this year), known end-of-life component issues and uncertainties in other aging mechanisms significantly increase risk with any additional schedule slips beyond an FY2020 FPU consistent with the current Selected Acquisition Report commitments. However, it is my opinion the B61–12 needs to remain aligned with the planned first production near the end of FY2020 to assure confidence in the ongoing safety, security, and reliability of the weapon in the face of continuing degradation of components.

Regarding schedule drivers, there are two overarching causes for slip: technical issues and budgetary changes. With respect to technical risk, I have the highest level of confidence that technical issues will NOT cause impact to Sandia's schedule performance. With respect to budgetary changes, I cannot be as sanguine. In FY13, sequestration impacts caused some technical activities to be moved into FY14. We estimated the schedule impact of those shifts to be relatively small—on the order of 2 to 3 months over the life of the program (within overall schedule contingency). However, at the time of my testimony, we are operating against a FY14 resource allocation that, on an annual basis, is at least 23% below the FY14 requirement, as contained in the most recent NNSA-approved Baseline Change Requests to the Selected Acquisition Report, approved in October 2013. Until the final FY14 Energy and Water Development Appropriations bill is enacted, NNSA does not have the authority to provide a definitive funding level for the program. Obviously, unless addressed, budgetary changes of this magnitude will have significant schedule impact.

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